April, 1945 25 cents

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U.S. ARMY AIR FORCES

U.S. NAVY

U.S. COAST GUARD

ROYAL AIR FORCE

FLEET AIR ARM OF THE ROYAL NAVY

SIKORSKY HELICOPTERS

WITH THE ARMED SERVICES

Approximately a hundred and fifty Sikorsky helicopters have joined the armed forces. They are serving with the U. S. Army, Navy and Coast Guard, R. A. F. and the Royal Navy.

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APR 16 1945

How to Maintain Clean, Attractive Airplane Interiors

IMMACULATE GALLEYS, SPARKLING UTENSILS

Silverware, vacuum containers, serving dishes and utensils are maintained in a lustrous, perfectly clean condition by Turco Blu-Fax, a soapless, fast-dissolving cleaner which removes oil and particles through a balance of wetting, emulsifying, and dispersing properties. Galley equipment is kept bright and grease-free simply by wiping with a Blu-Fax solution.

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Destruction of all insects which the airplane may harbor is critically important, both as a public health measure and to assure the health and comfort of passengers and crew. Turco Industrial Insecticide was designed for maximum effectiveness in the destruction of all forms of insect life. A non-staining, non-toxic liquid, it is applied simply by spraying.

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Science Speeds and Simplifies Aircraft Interior Housekeeping

Airplanes are being operated on the fullest possible schedules, leaving little time for the many routine cleaning jobs on which the appearance of the airplane and the comfort of the passengers depends. Because of manpower shortages and terrific time pressures, every second available for cleaning must be made to yield maximum results, and to contribute its full share towards prolonging the life of irreplaceable equipment. Lost motion, fumbling with ineffective "rub and scrub" cleaners cannot be tolerated.

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Turco's research facilities and technical staff are always at your disposal, to help you solve your problems. Fill out the coupon below for a complete demonstration of the labor-saving, scientific cleaners described here.

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INDUSTRIAL CHEMICAL COMPOUNDS

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I am interested in a free demonstration of Turco methods of speeding maintenance of aircraft interiors ☐

Please send your free, 32-page, full color booklet, "Chemicals in Aviation Maintenance." ☐

*My cleaning problem is*_____ *Please outline your suggestions, without cost to me.*

NAME_____

FIRM_____ TITLE_____

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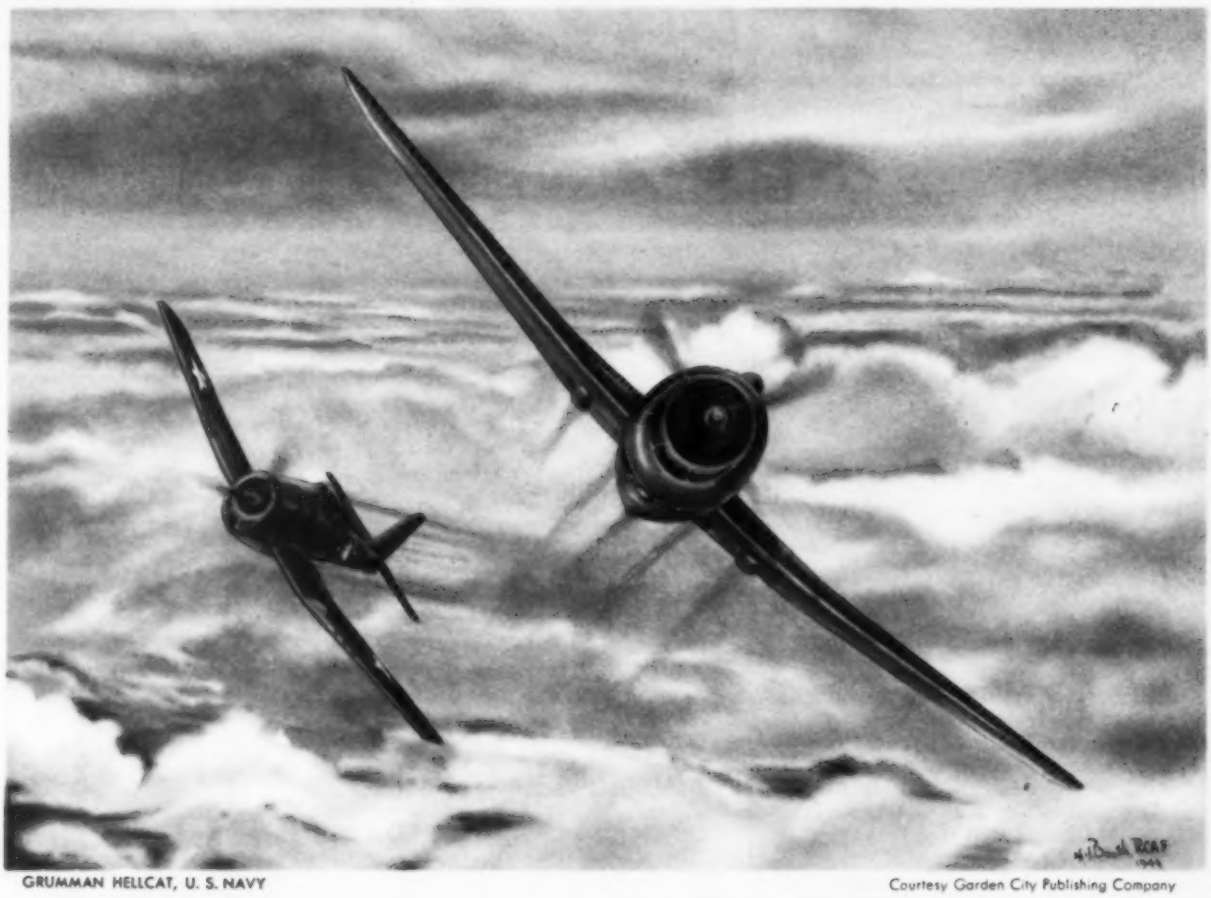
LUSCOMBE FABRICATES METAL PARTS FOR THE GRUMMAN "HELLCAT"



GRUMMAN HELLCAT, U. S. NAVY

Courtesy Garden City Publishing Company

ALL-METAL PLANES FOR WAR AND THE LUSCOMBE ALL-METAL *Silvaire* FOR PEACE

LUSCOMBE SILVAIRE

Luscombe's whole history has been one of utilizing metal in aircraft. In pre-war years, Luscombe pioneered with an all-metal light plane... THE SILVAIRE. War-time experience has produced abundant evidence of the supremacy of all-metal construction. Luscombe has had the privilege of sharing in the development of vital fabricated metal parts used in many of the famous fighter planes of the United Nations. Following the war, the experience gained from years of 100% war production will enable us to offer a new, notably improved all-metal SILVAIRE. For further information, write Dept. SN.

LUSCOMBE AIRPLANE CORPORATION, TRENTON 7, NEW JERSEY

Revving Up

FLASH: Physical examinations for private pilots may be made by any registered physician beginning June 1, according to an order signed by T. P. Wright, Administrator of Civil Aeronautics. The order directs CAA inspectors to provide applicants with a simple form to be filled out by any "competent, licensed physician." The CAA will prepare the special form for use by any physician. On the back of the form will be any special instructions pertaining to the examination which it is felt are necessary and appropriate to include as a guide to the examining physician. The change applies only to applicants for private and student pilot licenses. Physical examinations for commercial certificates will be unchanged, and will still be given by physicians whom the CAA designates. (See Jim Batchelor's story on page 25.)

★ ★ ★

FUEL OUTLOOK: **Postwar consumption of gasoline by civil aircraft of more than one billion gallons annually has been predicted by G. K. Bower, with American Airlines, Inc., at LaGuardia Field. He expects that by 1954 air transport operators alone will be paying more than $70,000,000 annually for fuels and lubricants, and he added that he believed that the airlines will be less interested in "super-fuels" than in a limited number of grades of gasoline which would satisfy varying operating needs economically. Earle A. Ryder, Pratt & Whitney, stated that gasolines of 91 octane number are generally satisfactory for domestic airline operations. Dr. R. T. Goodwin, Shell Oil Co., said that fuels suppliers desire to limit the number of grades of gasoline, and he proposed a maximum of five grades: 80 octane for light and medium use; 91 for regular use; 92 or 93 octane for special use; 100 octane for military use, and higher grade for long-range trans-oceanic flying. Doctor Goodwin stated that wartime experience is extending knowledge, and that postwar fuels will meet requirements for long-time storage.**

★ ★ ★

TALKING 'EM DOWN: The CAA crew in the control tower at Fairfax Field, Kansas City, saved a B-29 and its occupants recently in a fight against ice, fire, wild propellers, crippled radio and a snowstorm. The pilot was lost and, with only straight-down visibility, could hardly give a coherent description of the terrain. Finally he reported a couple of radio towers, and the control tower had a clue. But visibility by then was down to one and one-half miles, and worsening. They told him to make a 180-degree turn and go back over the towers, but he lost them and found himself over some brightly-lighted streets. They figured he was south of town, and headed him north, where he encountered heavier snow and lost all contact. But a radio-equipped crash truck stationed on the field reported engine noise. A couple of men in the tower walked out on the open deck and pointed east, following the sound. When they were pointing northeast, the B-29 was instructed to turn 90 degrees left and hold a west course until notified. When the deck listeners pointed north-northwest, he was advised to make a short 90-degree turn to the

(Continued on page 42)

SOUTHERN
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Twelfth Year of Progress with Aviation

APRIL, 1945 VOL. XXIII, NO. 4

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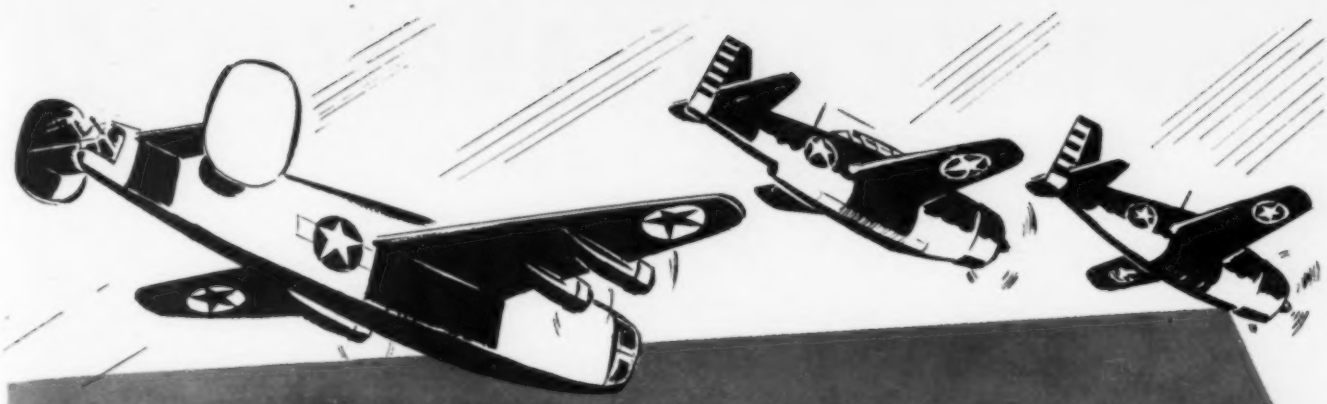
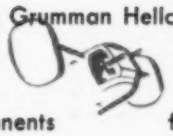


Working Together for Victory!

● Yes, the B-24 Liberator bomber, Grumman Avenger (torpedo plane), the Grumman Hellcat (fighter) are all working for victory as are the employees  of SOUTHERN AIRCRAFT—who produce vital components for these ships. ¶ SOUTHERN also works for the day of peace when aviation will lead the era of progress. Just as Sputhern's tail gun turrets, bomb-bay doors, stabilizers and fins speak for their producers . . . YOU speak for America with your purchases of War Bonds. Be sure to keep them to purchase Southern's post-war plane. Keep an eye on . . . .

Southern

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JUST AMONG OURSELVES

Editorials and Comment

SABOTEURS AT WORK

LAST month these columns pointed out the tragic results which certainly will befall domestic aviation development if the Bureau of the Budget succeeds in forcing crippling reductions of Civil Aeronautics Administration airports service personnel. Only last minute congressional action can now save the present CAA airport organization with its already understaffed group of technicians and engineers upon whom every community depends for practical guidance and sound advice in the planning, construction and maintenance of airports and airport facilities. Were it not for the fact that Congress is considering the early adoption of a tremendous national airport program, the reductions in personnel might be understandable.

However, the wholesale elimination of airports' service personnel is not the only dirty work going on in the strange campaign to sabotage the CAA. Serious curtailment of CAA-operated airport control towers throughout the nation is now threatened. Unless speedy congressional action provides the funds to carry on this essential traffic control service to military, commercial and private flying operations, many towers will close down or be taken over through necessity by the military authorities or by municipalities. The efficiently operated control tower system built up over the years by the CAA will be lost and, once gone, difficult to rebuild. Here again is a situation threatening the wholesale dissipation of technically trained Federal career men and women, indispensable to the present and future safety of military, scheduled and non-scheduled civil aviation.

That there has been an Ethiopian in the woodpile around the Civil Aeronautics Administration isn't news. It's been quite apparent for many months. Budget cuts of various departments have been made under the guise of war emergencies and no one dared to complain. Symptomatic of the casual but very active "economy measures" are such ridiculous practices as forcing CAA field men to travel around in Ford automobiles even though most of them are veteran pilots with thousands of hours in their logs. The pencil-pushing, figure-juggling Budget Bureau not only has failed to provide funds for respectable airplanes for the CAA but also has refused to authorize sufficient money to operate the few old ships on hand and keep them in airworthy condition. What a sad commentary on the legally constituted responsibility of fostering and encouraging civil aeronautics in the United States!

Then, too, there's the little matter of publishing and keeping current the official lists of civilian aircraft and pilots. The information is in the files but the Budget won't approve the few thousand dollars needed to carry on this vital job because of the "manpower shortage." We haven't observed any woman power shortage around the Washington bureaus, except where the Federal aviation agency is concerned.

In the light of postwar potentialities of civil aviation, the time has come to put an end to the penny-pinching kicking-around the CAA is receiving from the Budget Bureau. They are straining at gnats and swallowing camels up on the Potomac. When we consider that twenty years ago the Federal government assumed the responsibility of fostering, developing and regulating civil aviation, how can these so-called "economy measures" be justified? How can official government spokesmen trot about the country making optimistic speeches about the gr-r-r-eat future of aviation while the same government, through the Budget Bureau, knocks the props from under the very agency whose duties and responsibilities are clearly defined in the Civil Aeronautics Act of 1938? Congress, preoccupied with major war problems, apparently is not aware of the ultimate fate in store for domestic aviation.

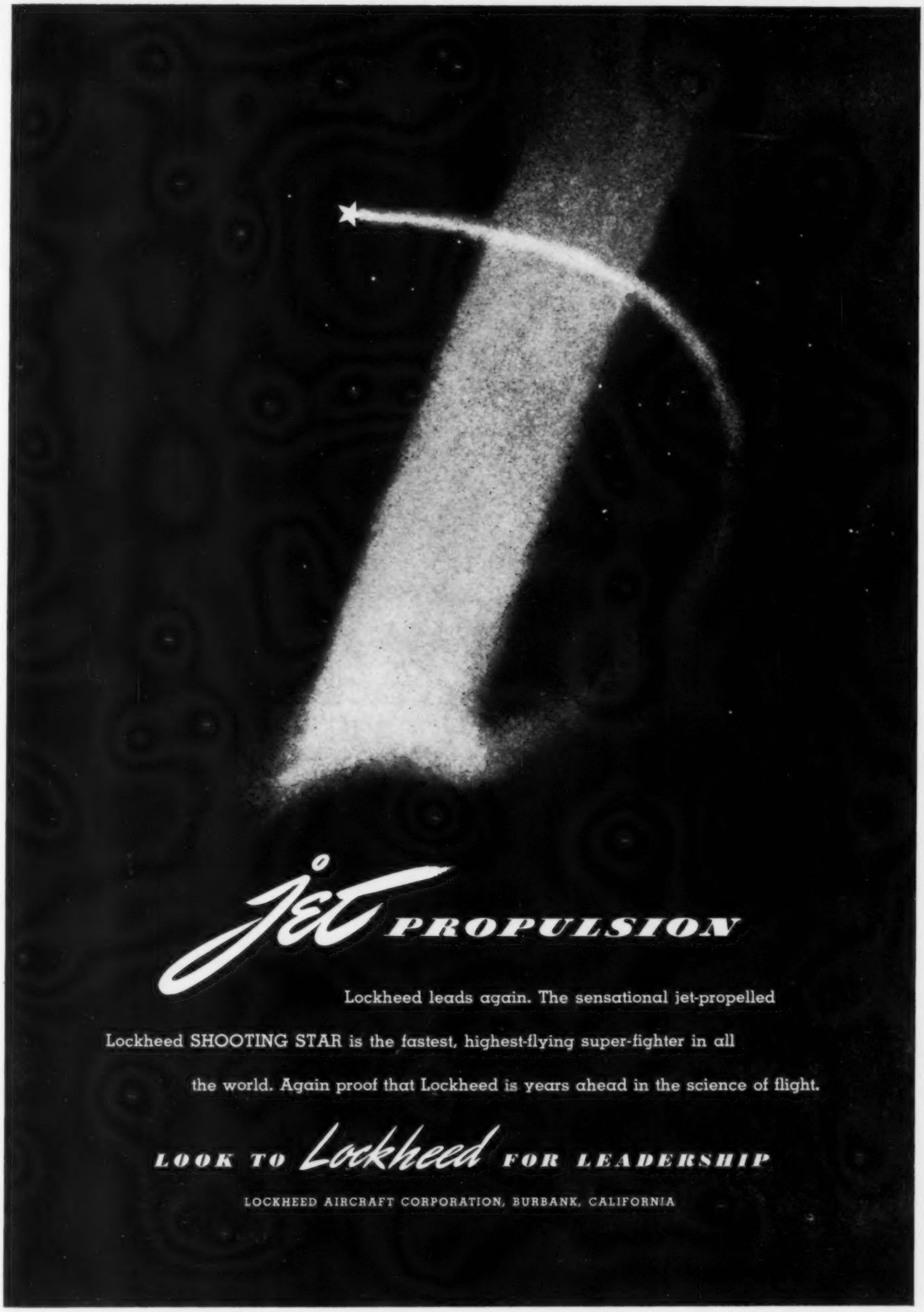
What is that fate? If the CAA continues to be undermined and sabotaged through shortage of funds to carry out its legally constituted duties, then it is logical to expect the early establishment of forty-eight state aeronautical codes, forty-eight different aviation police forces, forty-eight licensing agencies, forty-eight kinds of aviation taxation, hundreds of various methods of handling air traffic—all to such an extent that the average interstate motor truck operator will think he has an easy time of it compared with the harassed flier and air transport operators. Also, we can expect an uncorrelated, haphazard and wasteful airport building fiasco. Let the CAA structure go on cracking under new budget cuts and watch the forty-eight eager-beaver states take over. At this very moment aviation is about to be "balkanized" by many states in whose legislatures restrictive and duplicative aviation legislation is being considered. Don't think for a minute state assumption of safety and economic regulation won't come about if Uncle Sam continues to whittle away at the CAA's official duties.

The hour has arrived to stop taking this treatment lying down. The undercover emasculation of CAA duties and responsibilities, whether intentional or unintentional, is beginning to undermine all hopes for quick reconversion to accelerated peacetime aviation developments. It's high time for all of us to take the matter up personally with our representatives and senators and with the new Secretary of Commerce, Henry A. Wallace, who is showing a healthy interest in civil aviation by learning to fly. His power in the Roosevelt hierarchy is unlimited. Sitting in the driver's seat and ruling over the destinies of civil aviation in the United States so long as it comes under the jurisdiction of the Commerce Department, Mr. Wallace can, more than any other individual in Washington, bring an end to the financial sabotage of the CAA and put our Federal aviation agency back in business.

☆ ☆ ☆

LUSCOMBE AND TEXAS

THE decision of the Luscombe Airplane Corporation of Trenton, New Jersey, to build a plant in Texas on a recently acquired 500-acre tract of land near Dallas adds new significance to the Southwest as a strong contender for top spot in the production and sale of postwar personal aircraft. The veteran Eastern company brings with it an


Jet PROPULSION
Lockheed leads again. The sensational jet-propelled
Lockheed SHOOTING STAR is the fastest, highest-flying super-fighter in all
the world. Again proof that Lockheed is years ahead in the science of flight.
LOOK TO Lockheed FOR LEADERSHIP
LOCKHEED AIRCRAFT CORPORATION, BURBANK, CALIFORNIA

enviable record in prewar lightplane production and public acceptance.

Luscombe's decision came about only after several years of thorough study and research and after every region in the nation was carefully analyzed in order to find the most ideal location for aircraft manufacturing. Although it is true that new war contracts force the Luscombe expansion at this time, postwar implications of the company's choice should not be overlooked or minimized.

The new factory, when added to the North Texas airplane manufacturing colony already going full tilt, cinches the logical expectancy that the Dallas-Fort Worth area will emerge as a major center of postwar lightplane manufacturing. Continental Motors and Southern Aircraft, Luscombe's next-door neighbors, have blueprinted the future and are ready, willing and able to reconvert from war to peace. At near-by Fort Worth, the Globe Aircraft Corporation and Johnson Aircrafts, Inc., are now flying new postwar prototypes, around which will be built their plans to take a share of the accelerated postwar market.

Originally an agricultural, oil and distribution trade area, the Dallas-Fort Worth neighborhood, since the beginning of the war in Europe, has become a major source of military airplanes. This industrial transformation has created the machines and skilled labor heretofore lacking. These necessary elements are now and will be available in sufficient quantity to permit sound and economical aircraft manufacturing enterprise. The missing links have been supplied.

We don't know at this time whether the Army will keep any of the gargantuan war-born southwestern military airplane factories operating in the postwar era. This fact lends additional emphasis to the lightplane colony already established and we're looking forward with confidence to a brilliant and promising future. We join the members of this colony in welcoming Luscombe to the Great Southwest.

☆ ☆ ☆

GETTING DOWN TO CASES

WITH due respect to and sincere appreciation of the Personal Aircraft Committee of the Aeronautical Chamber of Commerce, we believe the time has come to face some fundamental issues regarding the long-range future of the personal aircraft manufacturers.

As now constituted, the ACCA Personal Aircraft Committee is powerless to accomplish all the many urgent missions so vital to lucrative postwar operations. Limited by part time executive effort, a relatively small budget and an understandable fear of talking too much about postwar plans, the committee has been forced by propriety to take the back seat and speak only when it has been spoken to. In spite of this uncomfortable position, tied as it is to the apron strings of all-out war production, the committee has managed to protect the interests of the personal aircraft manufacturers in several matters concerning Federal aviation policy. Likewise it has carried out several important educational missions, most noteworthy being the airport and airpark campaign instituted last year.

But in view of what's actually needed, the committee's activities have been mere surface-scratching. The personal aircraft manufacturers desperately need an aggressive, vigorous, hard-hitting public and press relations campaign, adequately financed and properly organized with a full time staff. If the ACCA feels that the time is not ripe for sponsoring the program, the manufacturers might well consider the alternative of organizing an interim association for the purpose of preparing the way for immediate postwar conversion to healthy, competitive and profitable markets.

The personal airplane manufacturers, if organized as a group, might well take a leaf from the book of the two Aircraft War Production Councils, whose effectiveness can be traced back largely to the active participation of the the major military aircraft company presidents. The most pressing problems facing the personal airplane manufacturers are common to all the manufacturers and weighty enough to demand the individual attention of each company's key executives. These common problems should be attacked now, not six months after the war is over.

When we consider that most of the airplanes manufactured in the prewar days were sold to people who make a living out of aviation, the urgency of reaching the thousands of business concerns, local, state and federal agencies and the tens of thousands of private individuals who compose the greatest aircraft market in history, can readily be appreciated. Such weighty problems as market analysis, co-ordinated public and press relations, the investigation of and publicizing new uses for airplanes in industry and business, public education and airport development are just a few of the jobs the entire industry must shoulder as an industry. While a few companies might hit one or two of the problems in a limited way, co-operative effort of all the personal airplane manufacturers would accomplish a bang-up job on a thorough, national scale.

We must stop dealing in generalities about postwar private flying and get down to specific cases. The public ear is all cocked and primed for news with substance in it instead of the wind and speculation they've been getting. Hardly a day goes by that SOUTHERN FLIGHT doesn't have a khaki-clad visitor or two and a half dozen letters from men in uniform wanting to know what kind of civil aviation set-up they will be coming home to, where their opportunities lie, and the specific kind of airplanes that will be available. Hundreds of communities are groping about for sound advice in formulating their plans to get on the aviation map, how to build adequate airfields without federal money, when to start and how to go about it.

A public and press relations counsel for non-scheduled civil aviation can do more in ploughing the ground and getting good seed planted for future harvesting than a billion dollars of Federal funds on the WPA system. The personal aircraft manufacturers will have to carry the ball but we predict that once they're organized, healthy support will come pouring in from every other branch of the aviation manufacturing industry.

☆ ☆ ☆

NEW TRANSPORTS

THE terrific costs involved in the emergency reconversion of surplus military transports into commercial airliners renders the practice at best a temporary, stop-gap operation which should be eliminated just as quickly as possible.

One significant development insofar as the airlines are concerned may be found in the recent announcement that the Office of Defense Transportation has agreed to permit the aircraft division of the War Production Board to act as claimant agency for the air transport industry. This means that the airlines finally will be placed on a war necessity basis and pave the way for acquiring brand new airplanes instead of being forced to use obsolete military surplus craft that cost as much to reconvert as new equipment would cost. This is the "break" our airlines have been waiting for.

GLIDAIR for the present

Just as United Air Lines has planned for the future Age of Flight by ordering $25,000,000 worth of DC-4 and DC-6 airplanes, so has Glidden prepared with its line of Glidair Flying Colors. Today, United Mainliners and Cargoliners, flying more than 100,000 miles every 24 hours, are kept in perfect order by maintenance crews whose efforts won the 1944 "Class A" Aviation Magazine Maintenance Award. In that maintenance, Glidair paints and dopes are used on the entire United Air Lines fleet. Glidden paints are used not only on United's Mainliners and Cargoliners, but also on the company's automotive ground equipment, hangars and buildings, floors, general hangar and shop equipment.

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The Birdmen's Perch

By *Major Al Williams*, ALIAS, "TATTERED WING TIPS"
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.

LET'S HAVE AN UNDERSTANDING!

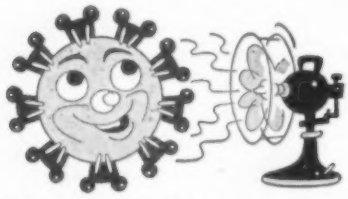
The Little Known Facts About Well Known Planes Dept. is good! It's interesting, informative, and entertaining. That's because the Little Known Facts you fellows send in are interesting, informative, and entertaining. For which we thank you prettily—and commission you Perch Pilots (bottom rung) . . . *BUT* . . .

We are beginning to think that there's a certain subversive element out to get us! Saboteurs whose motto is "Wipe Out Williams!" We suspect they are trying to slip a Little Known Fact into the Perch that'll maybe get us thrown out of aviation forever.

A letter from Mass., tells about a certain British ship with a landing-flap arrangement which is "connected to the airstream!" (What do they use, rivets?) Another fellow writes about the "R5D Consolidated Coronado (the freight-hauling version of the Liberator)."

Well, the R5D is the "Skymaster". . . the Coronado is a PB2Y . . . and neither of them has anything in common with a Liberator!

So will you be a little more careful in checking your Little Known Facts?



SOME FAN, EH KID?

An engine maker wasn't satisfied with the cooling of his power plant.

His solution was simple—he added a fan to cool the engine! Result was an increase in the rate of climb, high-altitude performance, cruising speed, and gross load of the planes in which the engine has been tested.

An oil refiner wasn't satisfied with the refining of lubricating oils.

His solution was simple—he added a step to the refining technique which virtually refined oil *which had already been refined!* Result was a decrease in the amount of carbon-forming and sludge-making fractions left in the oil.

Effect was more actual lubrication from a quart of oil.

Name is Gulfpride.

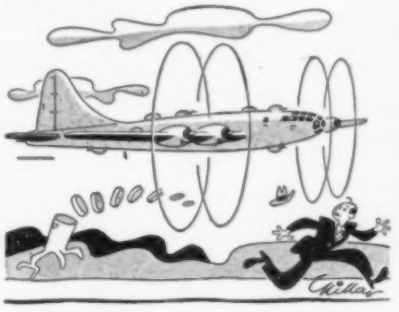
Maker is Gulf.

Try it!

Now here's a fact that Flutter dug up: In one day's fighting, a heavy tank will burn 500 gallons of gasoline! See why you oughtta buy an extra War Bond this month?

LITTLE KNOWN FACTS DEPT.

Arnold Paulson of Wallace, So. Dak. becomes this month's first Perch Pilot (br) with:



B-29 props have a greater span than the wing-span of some small airplanes, one of which had a wingspread of 12 feet!

Joseph Donaher, 69 Rockdale St., Mattapan 26, Mass., wins his commission with:

To fool observers, false propellors were attached to the P-59 (JP job) when it was moved from the factory to the testing area!

We hope we won't have trouble with the Army for the following promotion: Pvt. D. H. Kenyon, 435 Bomb. Sq. (VH), 333 Bomb. Gp. (VH), Army Air Field, Great Bend, Kansas, is hereby commissioned a Perch Pilot (br) for:

The heaviest items on the B-29 are not engines, or radio equipment, or armament—but the rivets, bolts, screws and other fasteners, which weigh more than all the engines together!

Gulf Oil Corporation and Gulf Refining Company...makers of

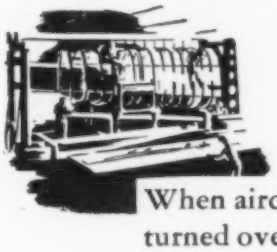
GULF AVIATION PRODUCTS

OIL IS AMMUNITION—USE IT WISELY

"COMPLETE"

is the word for Doak!

DOAK AIRCRAFT CO., INC.



When aircraft parts or assemblies are turned over to Doak for manufacture, the entire production job is done right here. For the Doak plant is a complete, self-contained metal-working factory with all necessary processing departments. A "plus factor" at Doak is the long background of our key personnel in aviation... all of whom have at least 15 years experience in aircraft production. The result of these specialized facilities and "know-how" has been a source of keen satisfaction to the prime contractors we serve in the maintenance of volume quality-production on schedule and in the development of many cost-cutting production short cuts. Doak Aircraft Company, Inc. Torrance, California.

MANUFACTURERS OF COMPLETE AIRCRAFT ASSEMBLIES

Pacific Airmotive, aviation's oldest and largest maintenance and supply company, announces the opening of a new $500,000 base at Anchorage, Alaska.

NOW in operation, PAC offers—

. . . The finest and most complete aircraft engine and accessory overhaul, maintenance, service and supply facilities.

. . . Stocks of supplies—actually in stock.

. . . AMSCO and PAC "shop-tested" service equipment.

Chart Anchorage as a prime service point on your world airway's map.

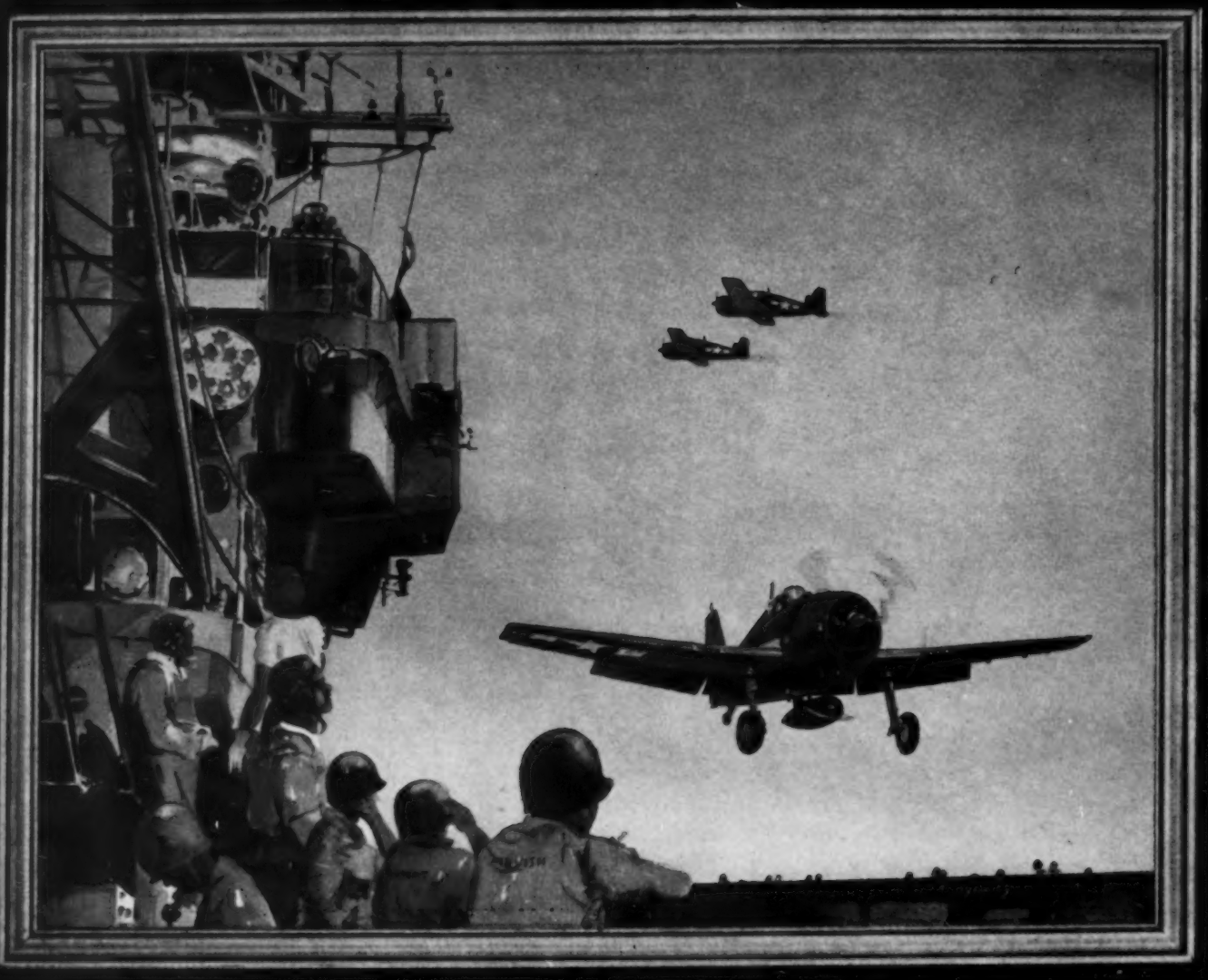
Other PAC bases:

BURBANK	Lockheed Air Terminal
GLENDALE	6265 San Fernando Rd.
OAKLAND	Oakland Airport
SAN DIEGO	544-7th Avenue
KANSAS CITY	1628 McGee Street
SEATTLE	P. O. Box 272, Kent, Wash.

PACIFIC AIRMOTIVE

PAC

-MAJORS LEAD THE FIELD
-SUPPLIES COVER THE FIELD



U. S. Carrier Launches Navy's Grumman Hellcats

Grumman

AIRCRAFT ENGINEERING CORPORATION, Bethpage, L. I., N. Y.

Sets New Standards for **DEPENDABILITY** *and* **TWIN-ENGINE ECONOMY**

Let the Marines TELL YOU

Marines flew their first fleet of Commandos from San Diego to Honolulu in 13 hours . . . 2,660 miles nonstop across unbroken waters. And, each Commando flew at a gross weight of 50,000 lbs. In such gruelling operations as Midway, the Gilbert Islands, Tarawa and Saipan, Curtiss Commandos sped vital cargoes of troops and supplies—evacuated the wounded. Yet, in fifteen months, the Marines never lost a single Commando.

Under the hardest of pounding in this and the other theaters of war, Curtiss Commandos have piled up invaluable flight and operating experience which Curtiss engineers have used to full advantage in developing the Commando to its present high stage of perfection.

When the Commando again "dons its civvies" as the world's largest and fastest twin-engine, luxury transport. airlines will be offered a thoroughly proven airplane whose operating economy cannot be matched on short and medium range flights that account for over 90% of all domestic air travel.

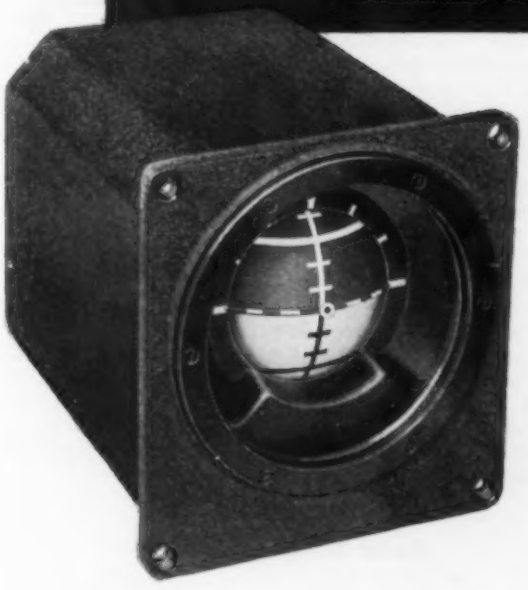
Combining twin-engine economy with a seating capacity of 36-42 passengers and 526 cubic feet of cargo space, the Commando should earn the airline operator a maximum net profit from the anticipated postwar increase in both passenger and cargo business. Curtiss-Wright Corporation, Airplane Division, St. Louis, Mo.

Curtiss Commando

Passed the toughest tests ever given a Transport Plane

FOUR FREEDOMS IN FLIGHT...

THE SPERRY ATTITUDE GYRO OFFERS FREEDOM FROM CAGING · TUMBLING · MISINTERPRETATION · FATIGUE



Now, for the first time, the pilot knows the attitude of his plane continuously, at any flight angle, regardless of visibility or extreme turbulence.

An electrically driven gyro stabilizes a sphere which is universally mounted—without limit stops—allowing full 360 degrees freedom of indication about the roll and pitch axes of the airplane. (The airplane actually maneuvers around the indicating sphere.) No caging is needed!

Pattern indication by daylight or by artificial light gives the pilot a quick, visual picture of his attitude at all times—a single glance tells the story. Thus the pilot can control his aircraft under instrument conditions for long periods without fatigue.

The Sperry Attitude Gyro makes instrument flying safer, easier, and more versatile. Write our Aeronautical Department for further information.

SPERRY GYROSCOPE COMPANY, INC. GREAT NECK, N. Y.

★

Division of the Sperry Corporation

LOS ANGELES · SAN FRANCISCO · SEATTLE · NEW ORLEANS
CLEVELAND · BROOKLYN · HONOLULU

GYROSCOPICS · ELECTRONICS · RADAR · AUTOMATIC COMPUTATION · SERVO-MECHANISMS

Dependability BORN OF EXPERIENCE

21 YEARS OF EXPERIENCE in propeller craftsmanship goes into every Fahlin propeller. And every Fahlin propeller is calibrated and tested before receiving its final "ready-to-fly" okay.

A few of the reasons why a FAHLIN PROPELLER delivers superior performance are (1) Fahlin's exclusive airfoil design increases efficiency, helps to eliminate flutter, adds years to the propeller's service, (2) only selected birch is used — thoroughly seasoned and tested, (3) finest Zapon finish furnishes extra protection from elements, (4) perfectly balanced and calibrated, (5) double thickness tipping provides greater strength on tips and leading edge.

Use a Fahlin propeller first, last and always for superior performance, strength, and dependability. Get the most from your engine—use *all* those "horses"—and enjoy the added pleasure and pride that comes from having a truly fine propeller.

Fahlin *Manufacturing Co.*
COLUMBIA, MISSOURI

FREE folder sent on request—gives full details of Fahlin features. Write TODAY for your copy.

AIR REPORT

☆ SIGNIFICANT TRENDS IN THE NEWS

Progress That Counts

Healthiest signpost for immediate improvement in non-scheduled private flying activity is the constant increase in student pilot certificates issued by the Civil Aeronautics Administration. In February, 1944, CAA issued 1,914 student certificates, and in February of this year, 4,158. The month of February has never been one of the best months so the increase means something. A total of 55,820 certificates were issued last year and with the rate of issuance up sharply, expectations are that the figure might hit 100,000 for 1945.

★ ★ ★

Jet Developments Coming to Light

Pratt & Whitney has both jet and gas turbine engines; Chance Vought has "an entirely new" Navy fighter; Westinghouse will bid for postwar commercial aviation turbine business. (See page 74).

All that has been officially said about Ryan Aeronautical Company's new Navy fighter is that it is of "radical design." Now comes this interesting circumstance: DeHavilland Aircraft Company's R. E. Bishop, chief designer, and C. T. Wilkins, assistant designer, recently dropped in on Ryan at San Diego. Their mission was described by the Ryan plant paper as being "to get ideas from our production methods and, incidentally, to get a good squint at the fighting plane Ryan is turning out for the Navy." They left with comment that "Ryan has something which should give our enemies the surprise of their lives." Note: England's newest fighter has been revealed by the British Air Ministry as a jet-propelled DeHavilland, and Bishop and Wilkins are described by Ryan as being "ardent proponents of jet propulsion and small fighters equipped with more than one power plant; they scowled at some jet-propelled models which they called 'much too big' for fighter operations."

★ ★ ★

Lower Prices for Accessories

You won't necessarily have to wait until personal plane output soars to obtain instruments and accessories at more reasonable prices than before. Several dependable manufacturers are preparing them now. Included in the new products will be at least two moderate-priced, lightweight automatic pilots for the personal flier. One is planned by Lear and another is being readied by a manufacturer who isn't ready to talk yet. Price commitments haven't been made, and the adjective "low" doesn't mean "cheap."

★ ★ ★

Emphasis on Hangars

Aircraft engineering ingenuity is being applied by a Texas firm in the preparation of a smart design for individual hangars. It will be of metal and incorporate several construction features new to the hangar business. Incidentally, several prominent aircraft distributors and dealers are looking into the prospects of marketing individual hangars with their planes, financing both on the same paper and delivering both as a "package."

★ ★ ★

Radar Developments

"Mickey," the device which makes it possible to bomb through clouds, is no longer so mysterious. Robert F. Six, president of Continental Air Lines, says "Mickey" is a radar gadget and that CAL is installing it in B-29's. It is effective not only to bomb with but to spot surfaced submarines at night, assist in landing planes when the runways are socked in and to locate fliers down on the ocean. . . . Liberators equipped with "locating devices" and called "Snoopers" have dealt Jap ships and airdromes misery for many months. . . . British radar gadgets were used

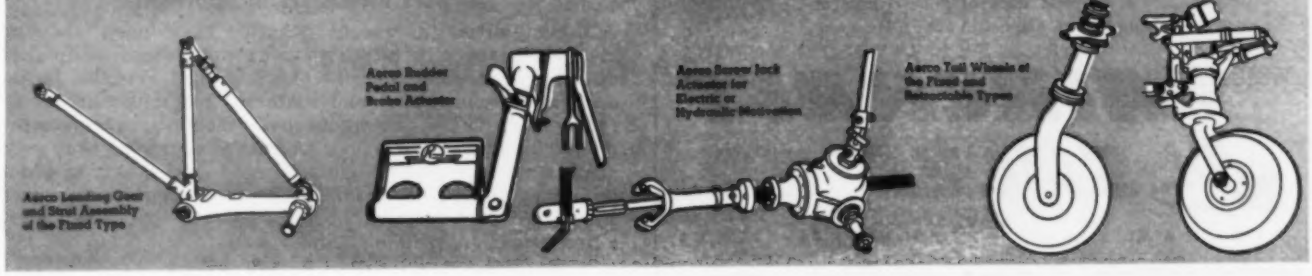
"*Dang* these one-wheel landings . . ."

There's a sure way to fix that . . . Aerco actuators won't let you down on one wheel. Reliability and performance are built in — built in by years of experience in producing landing gear assemblies for Army, Navy, and civil aircraft installations. Aerco actuators are available with either hydraulic or electric motivation.

Whether you need simple tail wheels, or complete landing gears of the conventional or tricycle types, Aerco engineers and facilities are at your service. Inquiries invited.

AERCO CORP.
HOLLYDALE, CALIFORNIA

TYPICAL AERCO PRODUCTS


Aerco Landing Gear and Strut Assembly of the Fixed Type
Aerco Rudder Pedal and Brake Actuator
Aerco Screw Jack Actuator for Electric or Hydraulic Motivation
Aerco Tail Wheels of the Fixed and Retractable Types

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Southwestern HEADQUARTERS Replacement Parts

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We have a complete stock of Stinson Airplane parts to supply all requirements of Operators and Individual Stinson owners — let us know your needs, phone, wire or write for IMMEDIATE DELIVERY

Our government approved repair shops are equipped for fast maintenance, any aircraft repair or complete engine overhaul — service "that speeds you on your way".

PARTS DEPARTMENT—Along with our large stock of parts for your aircraft, engine and their accessories, we also carry a complete stock of pilot equipment, including Flying Jackets, Manuals, Plotters, Maps, etc.

AIRCRAFT SALES CO.

MEACHAM FIELD FORT WORTH, TEXAS

by Navy gunners to sink the German battleship Scharnhorst at an "incredibly long range" and earlier by fighters during the Battle of Britain. . . . Aircraft designers and modifiers are tearing their hair trying to streamline airborne radar equipment. It's next to impossible, and unless something is done, new planes will have to be designed around the equipment.

★ ★ ★

New Equipment for Carriers

No finer planes have been in combat than Grumman's Hellcats and Avengers and United Aircraft's Vought Corsairs. They have not only bested enemy carrier types but have repeatedly mastered Japanese land-based types. But the Japs are putting newer types into action which are more of a threat than those our carriers met a year ago. The newer Nips are being encountered in the enemy's home areas. Development of super Navy fighters and torpedo bombers has been under way for months and they probably would have entered combat by now except for rigorous testing and extra requirements which characterize Bureau of Aeronautics procurement. These include jet-propelled craft as well as faster, more effective dive bombers and torpedo bombers. No names or specific types are being talked by the Navy, but it is common knowledge the carrier forces will more than offset Japanese developments in the not-too-distant future. In addition to stiff Navy tests, delay is also due to cautious Navy development of pilot and crew proficiency with new equipment.

★ ★ ★

V-E Day Moving Won't Be Simple

The problem of basing as many Allied bombers within range of Japan as are being used to finish off Germany will influence strategy against the Nips. Only super bombers such as B-29 and B-32, plus fighters, can make effective use of the small islands stretching from the Marianas to Tokyo. There is more room on Formosa, but B-17's and B-24's operating from there won't do much damage to the Jap homeland. If the China coast is invaded, and dozens of big air bases constructed, the range will still be too great for types smaller than the supers. It looks as if super bombers and carrier-based equipment will be the only means of carrying strategic air power to Jap home industries, including those in Manchuria, for many months to come—unless Russian developments materialize sooner. Meanwhile, the thousands of B-17's and B-24's now used in Europe will have few places to go after V-E Day. Vice Chairman W. L. Batt of WPB has said the AAF will have to be "pretty completely re-equipped" for the war against Japan.

★ ★ ★

Long-Range Schedules Coming

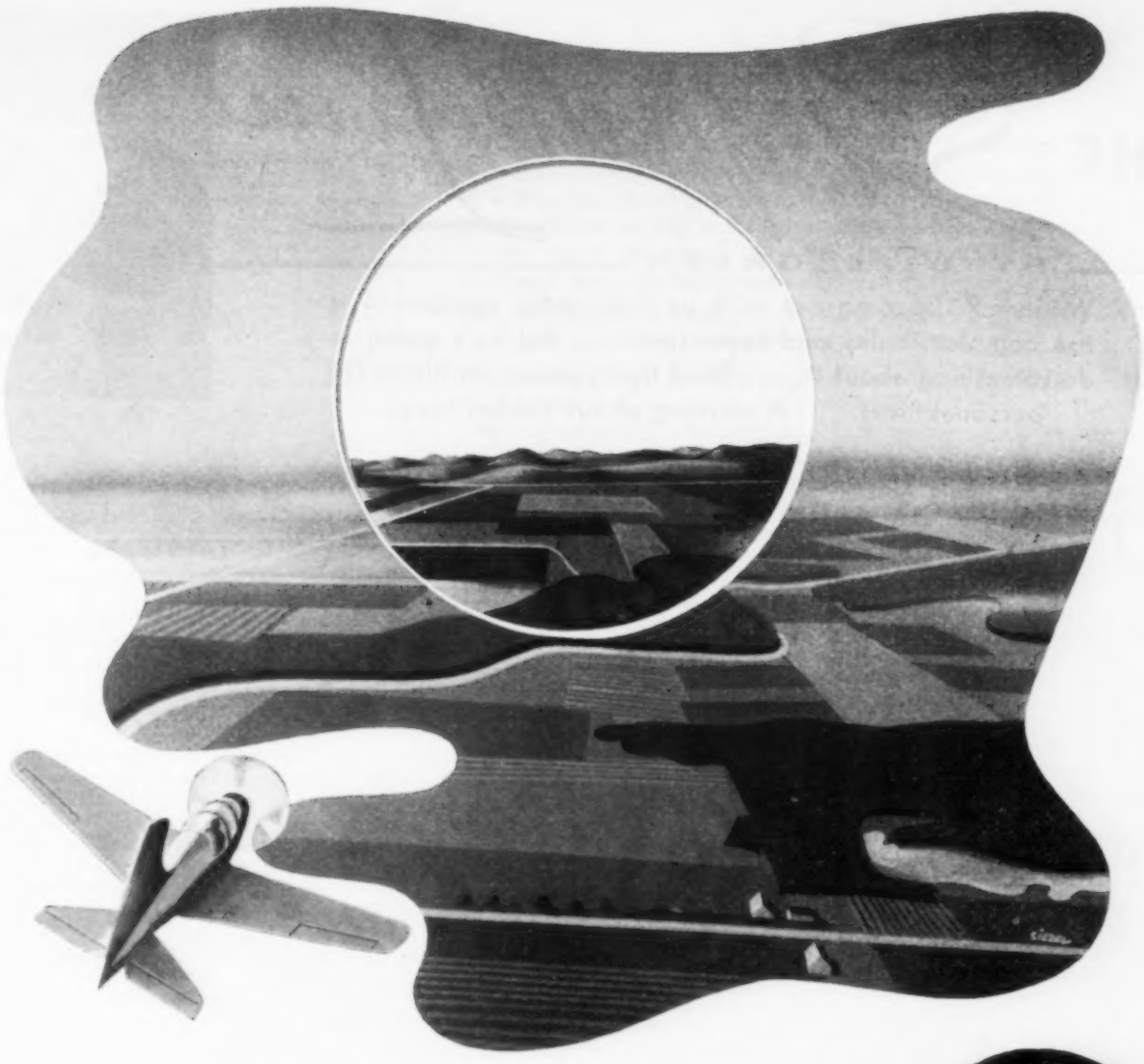
Air travelers and operators alike received news of Boeing's C-97 flight from Seattle to Washington in six hours three minutes and fifty seconds with more than casual interest. The day of commercial nonstop and one-stop transcontinental schedules is just around the corner. DC-4's have been flying nonstop from the U. S. to Paris for some time now. Virtually unnoticed recently was the nonstop flight of a DC-4 from Hawaii to El Paso, Texas. It carried Donald Nelson and other VIP.

★ ★ ★

Airport Managers in Spotlight

Municipalities in recent months have been showing greater interest in airport profits and losses. Slip-shod business methods, absurd contracts and rentals, lackadaisical merchandising and customer treatment are being recognized. Those who would make their airport operators more efficient and businesslike will next realize that good airport management demands better salaries—cities which underpay their airport executives will continue to hold the sack, for as managers become smarter operators, alert cities elsewhere will hire them away.

★ ★ ★



Window in the Sky

A startling number of good flying days are lost to pilots who want to fly but find the contact method wearisome when visibility is restricted by "horizon haze."

With good instruments and the ability to follow them, such conditions are no deterrent to easy, safe and useful flight. And further, knowing how to use instruments is excellent protection in case the weather really does get thick en route.

The trend in the planes of the future is increased speed and longer range to expand cross-country travel. But this new utility cannot be realized without competent instruments and competence in using them. So if you're planning your future flying with instruments in mind, you're *right*. They will open up new avenues of the sky for your enjoyment and benefit.

Write today for our interesting and informative booklet, "Facts About Kollsman Aircraft Instruments"! Kollsman Instrument Division, Square D Company, 80-08 45th Avenue, Elmhurst, New York.

"Kollsman" is the standard of accuracy on the airlines of the nation!

This is the Kollsman Sensitive Altimeter with which most of the nation's airliners are equipped and upon which they depend for safe flying procedures. The Kollsman Instruments you'll buy for your own plane will be just as dependable.

KOLLSMAN AIRCRAFT INSTRUMENTS

PRODUCT OF

SQUARE D COMPANY

ELMHURST, NEW YORK GLENDALE, CALIFORNIA

THE Sky's the Limit

BY BILL GREEN

William P. Lear agrees with us that radio equipment is too complex, bulky and expensive. . . . But he's going to do something about it. . . . Blind flying poses problems for personal fliers. . . . A warning about hidden taxes.

Prospects for Radio Aids

THE other day in New York, we heard William P. Lear, the father of Lear radios, address the Aviation Writers Association. His talk was interesting and timely and collaborated some of the notions we have expressed in these columns. From what we hear and have seen with our own eyes, there appears to be little or nothing in the way of thinking, seeing, controlling, measuring, flying straight, flying level, flying blind, landing blind, etc., ad infinitum, that cannot be done electronically.

The hitch comes in the fact that in most cases and for most applications, the equipment is complex, bulky, heavy and expensive.

Mr. Lear and his company have developed some very excellent communication apparatus and Lear has pioneered some wonderful blind or instrument flying equipment and instrument landing methods and equipment.

We personally flew into Columbus one day in a small storm so bad we could only see straight down. Not being familiar with the country, we would never have found the airport had we not been able to tune the automatic direction finder (built and installed by Lear) to the control tower at Columbus. We spied the airport at the identical moment that the needle turned around and pointed backwards, indicating that we had just passed over the control tower. That is pretty close work and we feel that in that particular instance, it may have saved our foolish neck.

That particular automatic direction finder cost us $1,500, plus installation charges, and we also needed a $500 transmitter to go with it. Both these items together weighed about fifty or sixty pounds and occupied a considerable space. Mr. Lear now tells us that he has an automatic direction finder scheduled for the postwar era which will also perform several other functions in the aircraft and which weighs a total, installed, of under twenty-five pounds. The price of the system will be within reach of small plane owners.

Mr. Lear intimated that some developments utilizing radar principles may be useful and may become a part of every vehicle, including automobiles, trains, airplanes, etc. He expects it will be necessary for the CAA to operate traffic control systems not unlike our automobile traffic lights in a quantity proposition rather than an individual one as at present. Traffic is probably going to be so thick a control tower will have to use some other method which will be capable of directing several aircraft simultaneously. It is possible that radar may solve this problem and that control towers will be able to visualize all traffic within fifty miles, spotting each aircraft and observing its motion at all times on a single large cathode ray screen.

Just before this war started, the CAA had a plan for replacing all airways radio facilities and traffic control facilities with high frequency equipment. This equipment has the tremendous advantage that it is free of static, fading, etc., and also that the spectrum is very much greater and can accommodate many thousands additional radio stations without congestion or confusion.

It has an additional advantage in that at least on the higher frequency the radio signal travels on a direct straight line and therefore may not be heard past the range of width, which is in most cases at an altitude of three or four thousand feet from fifty to 100 miles. Thus radio transmitters three or four hundred miles away on exactly the same frequency would not interfere as they do presently.

Mr. Lear said that especially for the private aircraft this high frequency equipment has not proved to be economical from the first cost standpoint, as the present equipment costs from two to five times as much as ordinary equipment. Transmitters and receivers have always been expensive but we believe doubling or tripling the expense would seriously handicap many prospective owners.

Dependability Needed

It is possible that Mr. Lear and other manufacturers in this field may find that a not too complex converter may make present radio equipment satisfactory for both the present and the new frequencies that will be developed. For several years while the transition is going on, it will be necessary for people to have both long and short wave or high and low frequency equipment, if they are to utilize all facilities. Since many aircraft are limited both as to weight and expense, this will not be satisfactory unless certain modifications of a simple and inexpensive nature can be made.

We had some experience not many months ago in which it was necessary to convert a number of aircraft to a considerable higher frequency and still be able to utilize existing radio ranges and control tower facilities. This was done in some cases by the development of a very light and cheap converter which very effectively served to utilize one receiver for both frequency ranges. We are certain that a man with the engineering ability Mr. Lear has displayed in the past can certainly do wonders with this problem and we are expecting him to announce such a gadget by the time it is required.

For some years, we have been designing and developing in our own plant electronic equipment to do many specialized jobs. We have made electronic equipment that has been to the South Pole and, what is even more remarkable, that has been stuck in a pipe and lowered into the bowels of the earth to ten and twelve thousand feet, encountering pressures that have crushed very hard steel cylinders in some cases (up to 10,000 pounds per square inch) and where the temperatures have approached 350° F. (Some solder melts or at least softens at this temperature so you can see what problems may be involved.) We have built this equipment the best we know how and have constantly improved it to make it more suitable, more field-worthy and more trouble-proof. In spite of this, we have occasional failures in our experience with aircraft radio equipment. We have also had a number of failures in our CAP operations in the anti-submarine work. Radio failures contributed more than their proper share of difficulties. This experience has also

(Continued on page 64)

POWER TO WIN

"Grasshoppers" Over Manila

"Grasshopper" planes again made headlines when General Douglas MacArthur triumphantly marched back into Manila. In the skilled hands of versatile American pilots, these highly maneuverable, Continental-powered planes were first over the Philippine capital to spot artillery and fortifications.

The startling and brilliant feats of these "Grasshoppers" in many capacities are almost incredible.

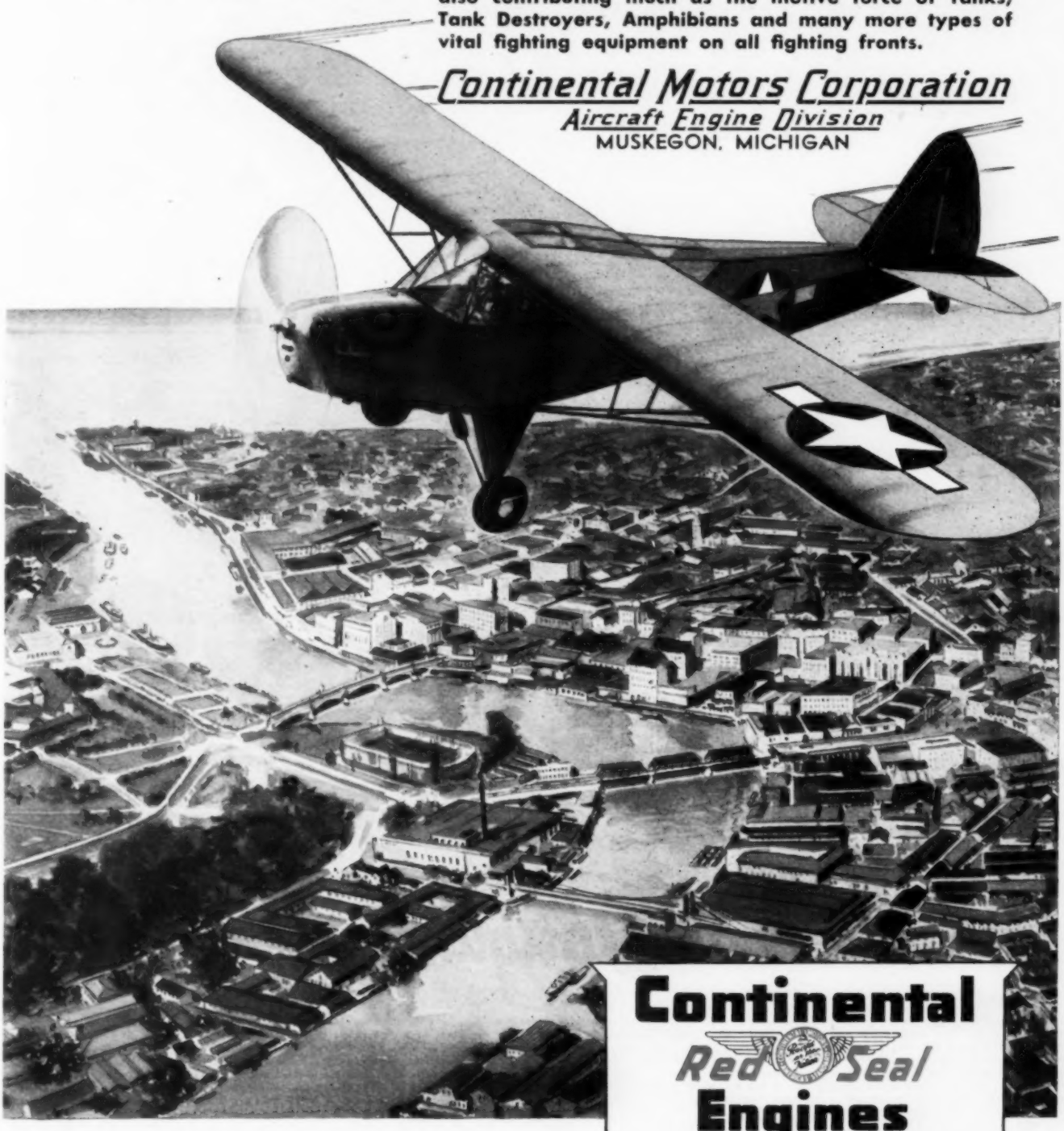
Continental Red Seal Power — the Power to Win — is also contributing much as the motive force of Tanks, Tank Destroyers, Amphibians and many more types of vital fighting equipment on all fighting fronts.

ARMY E NAVY

Awarded to the Detroit and Muskegon Plants of Continental Motors Corporation for High Achievement

Your Dollars are Power, Too! Buy War Bonds and Keep Them!

Continental Motors Corporation
Aircraft Engine Division
MUSKEGON, MICHIGAN



Continental
Red Seal
Engines

They shall not die!

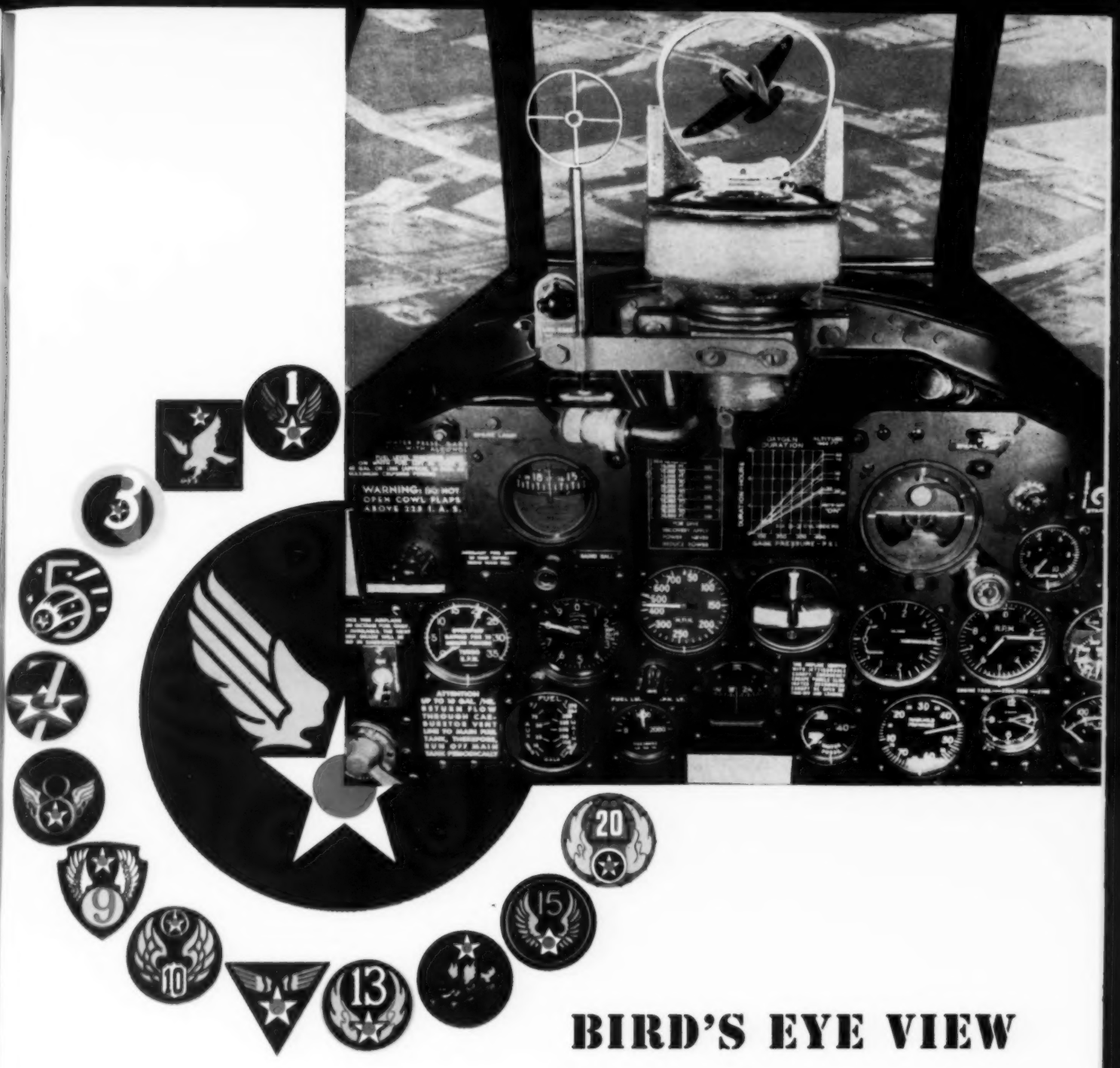
They will *live* . . . to be the citizens, husbands and fathers of the future. Hundreds of thousands of American boys, wounded on far-off battle fronts, are being restored to health and life because medical care, through the swift sure mercy of air transportation, is only a few hours away. Douglas workers, builders of planes for the airlines yesterday and tomorrow, are glad that today their skill can thus bring prolonged life to the country's heroes. This is our first obligation until the war is over.

Donald W. Douglas

GREATEST NAME IN AVIATION **Douglas**

DOUGLAS EQUIPPED AIRLINES: All American Aviation — American Airlines — American Export Airlines — Braniff Airways — Chicago & Southern Air Lines — Colonial Airlines — Continental Air Lines — Delta Air Corporation — Eastern Air Lines — Hawaiian Airlines — Inland Air Lines — Mid-Continent Airlines — National Airlines — Northeast Airlines — Northwest Airlines — Pan American Airways — Pennsylvania-Central Airlines — Transcontinental & Western Air — United Air Lines — Western Air Lines — A. B. Aerotransport (Sweden) — Aer Lingus (Ireland) — Aerovias Braniff, S. A. (Mexico) — Aerovias de Guatemala, S. A. — American Airlines of Mexico — Australian National Airways — Avianca (Colombia) — BOAC (British Overseas Airways) — Canadian Pacific Airlines — China National Airways — Cia. Mexicana de Aviacion — Cia. Nacional Cubana de Aviacion, S. A. — Cruzeiro do Sul (Brazil) — Indian National Airways — K.L.M. (Royal Dutch Airlines) —K.N.I.L.M. (Dutch East Indies) — IBERIA (Spain) — Panair do Brazil — Panagra (Pan American-Grace Airways) — PLUNA (Uruguay) — SABENA (Belgian Congo) — Swissair (Switzerland) — TACA (Central America) — TATA Airlines (India) — UMCA (Central America).

FIRST AROUND THE WORLD — FIRST THE WORLD OVER



BIRD'S EYE VIEW

"Here, Herrenvolk and sons of the Sun, is what a Thunderbolt pilot sees as he peels off to wipe you out... You've heard about the Thunderbolt?*... Of course you have, but as we say in our quaint American way, you ain't heard nothin' yet... You've brought 'em down?... well, that happens, too, but at what a cost men, what a cost... The records tell that gratifying story. ¶ And naturally you've examined with awe, these instruments and other details of the few ships that fall into your hands... so we don't hesitate to publish this fine view. ¶ Confidentially, we're well aware that if you had the blueprints and complete specifications, you haven't the time... you haven't the material... and more important still... you haven't, and never have had, the kind of people... with the kind of spirit and the freeman's pride of accomplishment, which have made the name 'Thunderbolt', a synonym for allied air supremacy."

***THE RECORDS OF FIGHTER SQUADRONS EMPHASIZE THE UNMATCHABLE PERFORMANCE OF THE THUNDERBOLT AND ITS PILOTS.**

REPUBLIC AVIATION

CORPORATION

Farmingdale, L. I., N. Y. — *Makers of the Mighty Thunderbolt* — *Evansville, Ind.*

THE BELL HELICOPTER

A new kind of flying

THOUSANDS *of inquiries demonstrate an enthusiastic interest in the new Bell Aircraft helicopters.*

One reason is that the helicopter provides a kind of flight we have always sought. In a helicopter, you can go straight up and down, you can hover, you can go sideways or backwards. All these things, impossible in a conventional airplane, can be done in a helicopter with safety and precision control.

And that accounts for the questions . . .

THE QUESTION OF WHEN . . . It is hard to draw a line between enthusiasm for the helicopter and realistic thinking on when helicopters will be available.

Bell Aircraft believes in the helicopter, believes in it as a practical aircraft, a safe aircraft, an aircraft with an important post-war future. We, too, are impressed by what it can do. In addition to its other advantages, for example, a helicopter doesn't need elaborate landing facilities and airports, and in "helicopter weather" with ceiling and visibility near zero, the helicopter can fly because of its ability to operate at low, safe speeds.

But the fact remains that helicopters, of the kind we expect to market, are not available now. Aside from the requirements of war work, which at Bell Aircraft come ahead of everything else, a lot of developmental work remains to be done.

And so it will be after the end of the war—say, a year or more—before Bell helicopters are available. But—helicopters *are* coming.

THE QUESTION OF COST . . . How much will a helicopter cost?

That depends on the kind and size of helicopter built, the volume of production and many other things.

The first Bell helicopters, however, will not be in the "low price car" field.

This means that the first helicopters will probably be sold to commercial and industrial concerns which have a need for them and which will find it economical to buy helicopters for business purposes. For such uses, the cost of the helicopter will be of less importance than its utility.

Low-priced helicopters will come—with mass production and further development.

ABOUT STABILITY . . . One of the most important characteristics of a helicopter is stability. The Bell Aircraft helicopter has it—engineered stability—through the use of a patented stabilizing bar which acts much like a gyroscope.

WHAT CAN YOU DO WITH A HELICOPTER?

Bell Aircraft feels that the helicopter will develop through various stages.

First, it will be used by industrial concerns that need it and can afford maintenance facilities and professional pilots.

Second, the helicopter will get into other commercial channels when circumstances make it possible to use them more widely.

Third, and later on, the helicopter will be used by sportsmen pilots and others who want safe, dependable air travel regardless of terrain conditions and despite poor weather. And finally, helicopters will get into the general market.

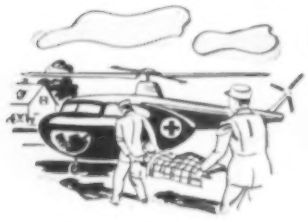
Bell Aircraft does not believe that the helicopter will compete with fixed-wing planes, but rather that it will open up a new and still untapped field of flying, a new dimension of flight.

AND IN CONCLUSION . . . We probably haven't answered all your questions. But we have tried to tell generally how helicopters work; what they can be used for; and how we think about them.

If you would like to know more, a booklet giving details regarding the Bell helicopter will be mailed without obligation. Write the Bell Aircraft Corporation, 2050 Elmwood Avenue, Buffalo 7, New York.

★ *Buy War Bonds and Speed Victory* ★

Specialized uses for the helicopter are many and varied. For example:



Suburban ambulance service

Commuter service

Forest fire control

Pipe line patrol

Coast Guard rescue work and disaster relief

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The Doctor Says NO!

Are you allergic to horse hair? If so, you can't get a student permit. A healthy revolt against unreasonable physical requirements points up an ancient deterrent to private flying.

By
JAMES W. BATCHELOR
Washington Attorney, United Pilots & Mechanics Association

"THE applicant shall have no organic or functional disease or structural defect or limitation which would interfere with the safe piloting of aircraft, or other duties of his airman certificate" has brought more discouragement to the hopes of many would-be private pilots than any other regulation on the books. The fullest realization of the "priesthood of the cockpit" can be realized only after one has passed the physical examination and has been "permitted" to soar aloft alone.

When Henry A. Wallace, Secretary of Commerce, announced recently that he intended to learn to fly, so that he might better understand the problems involved in flying, I could imagine him driving fifty miles to see a CAA medical examiner; meeting a man who had little interest in aviation and a poor conception of what it takes from a physical standpoint to fly; paying $6 "in advance" and possibly being told at the conclusion of the examination that if he has "hay fever" in season, he must have a special examination by an allergist recognized by the American Medical Association, and if the results show that he is allergic to ragweed, he will not be permitted to fly except under a ruling of the CAA Medical Division at Washington, D. C., and during the ragweed season he cannot fly at all.

Imagine my disappointment when I read in the afternoon paper that Mr. Wallace had hurried from work to the National Airport yesterday afternoon to take his first flying lesson from the Assistant Chief of the General Inspection Division of the CAA.

The idea of Henry Wallace being required to go through such an ordeal sounds ridiculous, doesn't it? Well, it sounds just as ridiculous to thousands of private pilots who have been doing the same thing for many years. Many have had exactly the same experience I have described and have lost out on the "home stretch" because of hay fever, mild forms of asthma, allergy to dog hair or "horse dandruff," adenoids which "interfere with nasal respiration" or a "malformation or any condition of the tongue producing interference with speech."

Need for Reform

During the past two years many articles have been written about the need for reform of the physical requirements for private pilot certificates. Most of them have been expressions of opinions based upon a few isolated cases of hardship which ultimately came to light. The only scientific approach to the problem was the Dean Brimhall report made about two years ago which concluded that physical defects as defined by existing medical standards had practically no connection with the proneness of pilots toward accidents. The CAA Medical Division denied the accuracy of the Brimhall report and claimed that the accident reports which were studied in compiling the study were "hand-picked" before the study began. This was denied by Mr. Brimhall and the Medical Division has not brought forth any proof of its charge.

The lack of dependable statistics and the deluge of charges and countercharges revolving around the whole medical problem of private pilots prompted United Pilots & Mechanics Association of Washington, D. C., to obtain from applicants who had been denied medical certificates some of the reasons given for the denials and to seek to determine whether such reasons had any reasonable relation to the ability of the applicant to pilot an airplane safely.

The first startling discovery was the fact that the letter which advises the applicant of the denial of a medical certificate does not state the reason why he failed to meet the "physical standards for Airmen prescribed in the Civil Air Regulations." The second startling discovery was the fact that the doctor who gave the physical examination is forbidden by the Medical Division to give the applicant a copy of his findings. The third startling discovery was the fact that the medical examiner is forbidden to let any individual or groups of individuals examine the Handbook for Medical Examiners or to reproduce any portion of it for their inspection.

"Why should the rules by which physical fitness is to be judged be kept secret from the public?" United Pilots & Mechanics Association wanted to know. When individual letters began to come in from disappointed applicants all over the country, the reason became more apparent. Joe Doaks, who had a stiff knee, was denied a certificate; Tom Smith, with one weak eye which could not be corrected with glasses, but who could see perfectly with the other one, had been denied; Mary Jones, legless since childhood, but who could fly a rudderless airplane with ease and precision, was rejected; Richard Rowe who furnished a doctor's certificate that he had not suffered an attack of asthma in six years was barred from the blissful vistas of the sky.

When applicants requested flight tests to demonstrate that their "aeronautical experience, ability and judgment" compensate for the physical deficiencies, some were denied as in the case of the legless girl on the theory that the rudderless airplane compensated for the physical deficiency, and that her aeronautical experience had nothing to do with it. The same rule was applied to other mechanical inventions used to enable persons with structural physical defects to fly.

The "straw that broke the camel's back" came in the summer of 1944 when an applicant for a flight test to demonstrate his aeronautical experience, ability and judgment was refused by the Administrator and he appealed to the Civil Aeronautics Board from what he considered an unjust and illegal denial of his request for a flight test. The General Counsel for CAA ruled that the applicant was not entitled to a flight test if the Administrator determined in advance that his defect was not such as could be compensated for by aeronautical ex-

perience. The Board ruled that the applicant should have a "fair chance" to demonstrate that his aeronautical experience, ability and judgment compensated for the physical deficiency and that he was entitled to a flight test to prove it.

Survey Reveals Opinions

To eliminate future cases of this kind, the Board proposed an amendment to the Civil Air Regulations to permit persons with structural physical defects to obtain licenses if they demonstrated that they could fly safely. United Pilots & Mechanics Association immediately sent out 3,000 ballots to airport operators, pilots and mechanics throughout the nation for an expression of their opinion. Less than 1 per cent of the votes cast were opposed to the amendment. On September 19, 1944, the amendment was passed by the Board.

Typical cases which this amendment was designed to cover which have come to my attention are: one short leg, missing fingers, hand, leg, one eye which will not correct properly with glasses, stiff joints, blind in one eye, etc. None of these cases present any serious complications so far as safety is concerned if the applicant meets the other physical standards and can operate an airplane with reasonable skill. Notwithstanding these facts it was only through constantly exerted pressure and the eminence of the passage of the "structural defect amendment" that the CAA Medical Division could be persuaded to assume a reasonable attitude towards licensing such applicants.

It was sixty days after the Board passed the amendment until the Medical Division of the CAA sent out its instructions advising medical examiners of the new amendment. Even then, the instructions were so restrictive that they failed to give full effect to the Board's intention.

When reports of continuing denials kept coming in, and complaints of unco-operative medical examiners, loss of unusual amounts of time from work by pilots in obtaining physical examinations, or traveling considerable distances to see medical examiners who were considered reasonable and fair by the pilots and operators, were added to the list, United Pilots & Mechanics Association decided to make a survey of the entire medical examiner situation. Confidential questionnaires were sent to a large list of operators, pilots, mechanics and members throughout the nation and to over 2,200 civilian airports.

The survey revealed that 64 per cent of those replying believed that existing physical standards for private pilots are too high and that 67 per cent are not satisfied with the present medical examiner system and favor permitting any licensed reputable physician to give the examination.

It also revealed that 33 per cent are dissatisfied with the present designated medical examiners because of "lack of understanding of aviation problems as related to physical condition;" "too rigid in application of existing rules;" "permitting personal prejudices to enter into the examination;" "lack of interest in aviation;" and "inability to obtain appointments."

The average number of pilots flying from airports reporting was found to be fifty-nine. The average distance traveled to obtain a physical examination where a local examiner had not been appointed was fifty miles. The approximate waste in man-hours from unnecessary driving was 210,000 annually which involved unnecessary driving of approximately 2,800,000 miles.

The survey also revealed that approximately 900 medical examiners are attempting to serve 3,000 airports and that one county having over 700,000 population does not have even one examiner. Many requests for appointment of medical examiners which had been refused were brought to light. One case was found where Dr. W. R. Stovall, Chief of the Medical Division of CAA, was reported to have denied a request for an additional examiner in a city of 700,000 and wrote the medical examiner already designated that "unless you recommend that an additional examiner be appointed, none will be appointed."

Most of us had thought that the structural defect amendment would bring an end to the unhappy problems of pilots over their physical examinations, but we were destined to a rude awakening. The Medical Division is not accustomed to "having it suggested" that they are "off the beam", nor do they intend to take it lying down.

Why All the Secrecy?

For years the Medical Division has hidden behind the legal maxim that "communications between a doctor and his patient are confidential communications which cannot be disclosed." They have declined many requests on behalf of applicants for a full disclosure of the medical reports in their files. They have failed to recognize, however, that the protection of the "confidential communication" status was legally established to prevent unauthorized persons from obtaining from physicians information which the client had given in strictest confidence. The applicant or his attorney are legally entitled to full disclosure of all the information obtained by the Medical Division as the result of the examination since the applicant pays the examiner's fee.

There is only one way in Washington to short-circuit government red tape. That way is by the use of the telephone. A conversation on the telephone saves the man-power involved in writing a letter to ask the question and the man-power necessary to answer, and best of all, it gives the applicant an immediate reply. Systematically I listed the cases as they came in and we called Dr. Stovall about them. Those which could not be denied certificates received them. Those about which there was some doubt were discussed on the phone and the "probabilities" were weighed. Sometimes Dr. Stovall agreed, at other times he disagreed. If the case was thought to have merit, I recommended that the applicant file a request for a hearing before the Civil Aeronautics Board.

Medics Not Pilots

I do not mean to leave the impression by this article that I do not have the highest regard for the opinion of a professional man made honestly and based upon proper information, knowledge, and understanding. There are many decisions which are made on paper that do not work when they are applied to every-day, practical problems. The field of aeronautical medicine is no exception. The men who are making these decisions are sincere but they are not pilots and they do not comprehend. Since 1928 we have had highly restrictive physical standards for pilots without many of us stopping to ask ourselves "Why are they so restrictive?" and "Do they really work and make sense?" So I kept hammering away trying to help those who appeared to me competent to fly notwithstanding their failure to meet all of the physical standards prescribed.

I predict that a determined effort will be made by the Medical Division, through its designated medical examiners and the "old guard" in the CAA to stall off further changes in physical standards for private pilots. It will also seek to limit any changes which may be made so that the present organization in the Medical Division and Safety Regulation will not lose any of its "power to deny" in the cases which cannot be classed as "structural physical defects."

Many cases which are trivial in natture, and in which the applicant has been denied a medical certificate are not classed as "structural defects." Adenoids, asthma, allergies, hay fever,

stammering, sugar in urine, hard of hearing, color blindness, etc. are not structural defects, but in most of these cases very little reason exists for denying a certificate. The power to decide whether licenses should be issued in such cases is not given to the local examiner. A person with hay fever, or partial color-blindness must wait sixty days for a special ruling from Washington before he is "permitted" to fly.

Persons who are not familiar with such cases refuse to believe that certificates are denied for hay fever, asthma, stammering, breathing through the mouth, harelip, etc., and most of them have to be shown in writing that many such cases exist.

Heretofore, only a few such cases have come to light because the applicant was reluctant to press for a hearing if his medical certificate was denied. But the public is becoming educated to the fact that they are entitled to a hearing before the Civil Aeronautics Board in any case where they have been the victim of the unjust application of a Civil Air Regulation. The result has been a tremendous increase in the number of cases filed with the Board seeking a hearing on applications for medical certificates. From June, 1940, to July, 1943, there were only five such cases filed, but from July, 1943, to March 22, 1945, there were thirty cases filed.

CAB Now Reasonable

From June, 1940, to July, 1943, the Board upheld the Medical Division in every case but since July, 1943, the Board has upheld the CAA Medical Division in only one case and the Examiner for the Board has recommended that the CAA be upheld in one more case where hearings have already been held. Despite this unusually poor showing before the Board, Dr. Stovall is quoted as stating the Board has upheld the decisions of the Medical Division in 98 per cent of the cases.

An interesting case involves a pilot who was allergic to dog-hair and suffered an attack of asthma in 1936. Since that date he had not been affected but he made the mistake of telling the medical examiner about it when he applied for a certificate in 1944. He was denied a license.

Another case involved an applicant who was allergic to horse-hair and "horse-dandruff" when he was a child. No recent affection was reported—in fact, he furnished a certificate from the family physician that he had not been affected for two and a half years, but he was denied.

In another case a Kansas flight in-

(Continued on page 40)

CAA's NON-SCHEDULED AVIATION ADVISORY COMMITTEE was photographed at its first meeting in Washington. Seated, left to right: Beverly Howard, president of Hawthorne School of Aeronautics; Ed Williamson, Bearing Service Co. of Seattle; Harry Playford of St. Petersburg, Fla.; Arthur I. Boreman, of Des Moines, Chairman of the committee; and T. P. Wright Administrator of CAA. Standing: Joseph Bergin, Director of Utah State Aviation Commission; Douglas Robinson, Air Safe Co., Tucson; William A. Mara, vice president of Bendix Aviation Corp.; Edward Garbacz, Central Flying Service; John Groves, Air Transport Association; Fred Weick, Engineering and Research Corp.; James C. Johnson, Springfield Flying Service, Mo.; William T. Piper, president of Piper Aircraft Corp. —(CAA Photo.)

CAA Advisory Group Hits Medical Exams, Surplus Frauds

THE decision of the Civil Aeronautics Administration to get advice from the field on its future program and policies by appointing a Non-Scheduled Advisory Committee was called a "great success" by committee members. The first meeting, held in Washington March 22 to 26, resulted in a set of recommendations and the scheduling of a meeting in Des Moines on April 14 to discuss the airport program.

Evidence that CAA is taking its new committee seriously was clear from the action taken by T. P. Wright at the close of the March meeting in ordering a change in the medical examination for the private pilot's license. Wright acted on the committee's recommendation that any registered physician be permitted to give the examination "guided by a simplified form provided by CAA, containing a minimum of physical requirements."

Another topic discussed at length in the five-day meeting was the proposal of the Civil Aeronautics Board to regulate non-scheduled flying operations. The committee's conclusions that the present general exemption order be continued for two years after the war were presented by Arthur I. Boreman of Des Moines, chairman, at the CAB hearing March 27.

The final meeting was devoted to a discussion of disposal of surplus government planes. The committee pointed to recent advertisements of the Reconstruction Finance Corp. of primary training planes for sale at "$875 to $2,400—average cost new to government approximately $9,000 . . . meeting rigid Army and Navy Specifications." They found the advertisements misleading since they exaggerated the original cost of the planes and failed to warn buyers that the planes would have to be brought up to CAA specifications.

The committee reviewed CAA's proposed revisions of the Civil Air Regulations and, although generally approving, suggested that written examinations be limited to contact flight, traffic and pilot rules and that applicants for a private pilot's license have at least eight hours of dual instruction before solo; a minimum of four hours of dual check time after solo and twenty-eight hours of solo flight time; or five hours of dual instruction before solo, three hours after and nineteen hours of solo flight time in non-spinnable aircraft.

The committee recommended the adoption of CAA's airmarking system and its extension to every community in the United States. They further asked that the Federal Communications Commission simplify radio licensing requirements and that CAA conduct an extensive study regarding approach channels to airports taking advantage of the many newly-developed devices and methods.

They suggested that CAA prepare the Civil Air Regulations in attractive booklets similar to those used in the Air Forces training program taking advantage of modern advertising techniques. They also asked that CAA make available its lists of airplane owners, certified pilots and student pilots. ★ ★ ★

Airline to Battle

Soaring over Hawaii's Molokai, a Navy Skymaster heads west towards far-flung Pacific war zones. —Navy Photo.

To win the battle of supply against Japan, the Naval Air Transport Service operates 23,000 miles of Pacific routes. Here's a closeup of NATS operations between Hawaii and Kwajalein.

By LT. JOE JAMES, USNR

—With NATS in the Pacific.

IMAGINE an area twenty times as large as the continental United States. Deposit 100,000 pounds of vital war cargo on one side of this area and, two days later, have that cargo safely unloaded on the other side. That, in a nut-shell, will give you an idea of the scope of the job being done by NATS PAC—Naval Air Transport Service Command in the Pacific.

From an idea on paper, from something many deemed impossible, NATS PAC has grown into an airline with 23,000 route-miles. Created to meet a demand for rapid transfer of cargo and personnel to the battle fronts of the Pacific, NATS PAC now flies cargoes direct from the West Coast of the United States to Guam in forty-one hours. Four-engine Skymasters and Coronados, operating night and day, rush vital equipment and key personnel wherever war needs dictate, and "on time." Some squadrons use the C-47, or R4D as the Navy calls it, and the RY, transport version of the B-24.

Just to keep from becoming involved, let's confine our interest to a Naval Air Transport Service landplane squadron based in the Hawaiian Islands and operating between the West Coast and the most forward Pacific areas. You come along with us on a flight from Pearl Harbor to Kwajalein, and we'll see how NATS operates out there.

After a quick trip from the States, you join our crew in the Hawaiian Islands. Our Squadron, you will find, is operated like a great airline. Crews come and go at all hours of the day and night. We meet in front of our quarters and ride to the NATS terminal building at the Naval Air Station, Honolulu, in a converted milk truck.

Shake hands with our plane commander, the first and second pilots, the navigator, the radioman, and the flight orderly. The odds are good that one of them is from your own part of the States.

Heavy Traffic to Points West

While the custom officials examine our baggage, let me tell you about this huge terminal. Through this low sprawling main building go thousands of passengers monthly en route to the Pacific battle zones. Admirals, generals, congressmen, skilled technicians, nurses, fighter pilots, submariners, war correspondents, officers and men of all the services, and civilians of equivalent status, all moving urgently westward to war. During the month of December we carried 13,805 passengers along some 31,000 route-miles of ocean.

This terminal is probably the world's busiest air mail center. In fact, mail handled during the year would total seventy pieces for each man, woman, and child in the USA. Airmail is funneled from the mainland to war fronts scattered over 40,000,000 square miles of ocean area—more airmail than normally passes through New York, Chicago, or San Francisco.

But take-off time is only an hour away, so let's go out and carefully inspect our airplane. Remember, a trip like the one we are about to make will cover a lot of ocean. Just a few years

ago people saw flights like this off with confetti, brass bands, and crossed fingers. Now this is routine.

Perhaps you have never closely examined a four-engine transport. Powerful and graceful, it reflects the engineering skill and the production-line sweat of homefront Americans. Standing beneath the plane, you marvel at its size. The tires would make a dozen for your own car—and what beautiful rubber! You look up into the nacelle into which the nose wheel retracts and see room enough for a kitchenette.

Other people have marvelled at the size of this airplane. For instance, there was the time the first NATS plane landed at Saipan. Fighting was still going on and the pilot, Lieut. Comdr. Harry Holman (former Braniff pilot), guided the big transport gingerly down the bomb-pocked runway. As the Skymaster rolled to a stop a grizzled GI approached in awe. Staring in amazement, he thrust one hand overhead, touched the massive belly of the plane, and solemnly announced: "Biggest damn thing I ever saw in my life!"

Take-off Procedure

The size of our plane (68,000 lbs. gross at take-off) is matched only by the amount and variety of cargo she carries. Life-saving blood is the most valuable and the most expedited single item. A full load of whole blood has been removed from one plane, re-iced, and placed on another airplane in thirty-three minutes. Checking the cargo manifest you may find such items as wheel chocks, medical supplies, a complete radio station, or even baby bottle nipples. The bottle nipples may be going to a newly captured island for native children. Then again they may be going to some husky, six-foot Marine who will use them to protect a machine gun muzzle from tropical rains.

But fasten your safety belt. We're ready to go.

The plane commander and first pilot warm the engines. We're cleared for take-off. As we move out on the runway, the plane commander steers the nose wheel with a small wheel on the left side of the cockpit. Lined up down the runway, he calls "fifty inches," and the first pilot advances the throttles until the manifold pressure reaches fifty. The plane picks up speed. The Skipper moves his hands from the steering wheel to the control yoke. More speed, and we're flying. "Up the gear!" Three thousand pounds of hydraulic pressure quickly lifts the landing gear and places the giant wheels in their nacelles. "Forty inches, twenty-five hundred rpm!" The first pilot sets the power and propeller pitch. "Flaps up, five degrees at a time!" The first pilot brings up the flaps, and we swing to our compass heading for the trip.

The lights of Oahu fade from view. At flight altitude we put the plane on the automatic pilot. Now there is little to do but keep a close watch on the instruments and reduce power according to our cruise charts. The navigator, in addition to keeping an hourly check on our position, also keeps a careful curve of gas consumption against time and distance. How far are we going? This leg of our trip is equal to a non-stop flight from Los Angeles to St. Louis. But this is nothing compared to a trip from Honolulu to San Francisco. Twenty-four hundred statute miles. About equal to flying non-stop across continental United States.

As hour after hour passes we move westward; you wonder about the Japanese. Pick out a few islands on the navigator's chart. There is Wotje, pronounced "Wote-jee". There, still, are Japs, slowly starving on their little atoll and wondering what became of Tojo's plan for rotation of Jap servicemen. There are other islands, too, where the Japs still hang on—bypassed when the Americans leapfrogged toward the Philippines and Japan. Our navigator carefully plots a course well clear of the little Sons of Heaven.

Airline Men Guide NATS

Our plane commander handles his airplane like a veteran airline captain. He is a young man of twenty-six and probably took his first airplane ride as an aviation cadet. After graduation from Corpus Christi or Pensacola, he took an extensive instrument course at Atlanta; this was followed by training with American Airlines, at Fort Worth, or Pennsylvania Central Airlines, at Roanoke, Virginia. Then followed a period of flying NATS routes in the States, more training, and eventually a check in this plane. A through knowledge of instrument flying is a prerequisite. Weather is normally very good in the Pacific area but a five hundred foot ceiling must be no handicap.

Some of the key men in our Squadron came to the Naval Air Transport Service from the airlines. The commanding officer of NATS PAC, Captain D. W. Tomlinson, was a member of a crack Navy stunt team and later vice president of TWA. Squadron Commander W. F. Peterson was a TWA captain.

Many of the men now flying NATS routes flew in civilian life for the sheer thrill of flying. Others were Navy or Army civilian instructors, cotton dusters, aerial photographers, or had their own flying schools. A few of the pilots we have encountered include: Lt. J. O. (Toots) Womack, of Marshall, Texas; Lt. Comdr. C. H. Dolson, operations officer, of Atlanta, Georgia; Lt. Comdr. Larry (Butch) Poole, Denton, Texas; Lt. Comdr. Clifford B. Skirvin, Ada, Oklahoma; Lt. Comdr. James A. Cooper, Dallas; Lt. "Tex" Marsh, Houston; Lt. Jim Pullen, Port Arthur, Texas; Lt. Fred Wright, Dallas; Lt. R. C. Johnson, Dallas; Lt. Harry Askew, Shreveport; Lt. H. C. Nelson, Corpus Christi; Lt.

(Continued on page 40)

Familiar scenes along NATS routes include Tarawa (left), where Jap tank, knocked out during invasion, rusts away on beach; Los Negros (center) in the Admiralties, on which runway American invaders mowed down hundreds of ambushed Japs, and Kwajalein (right) in the Marshalls, where this pillbox withstood murderous Navy shelling only to be cleaned out by grenades. —Navy Photos.

Suggested Standards for Private Aircraft Radio

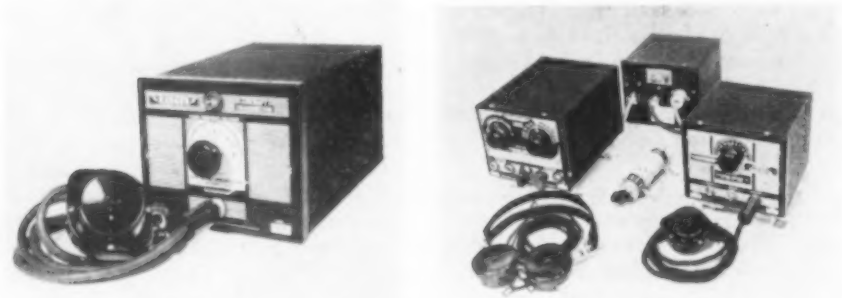
Dependable radio performance for the private flier demands quality and uniformity in equipment.

By KARL H. STELLO
Member, Institute of Radio Engineers

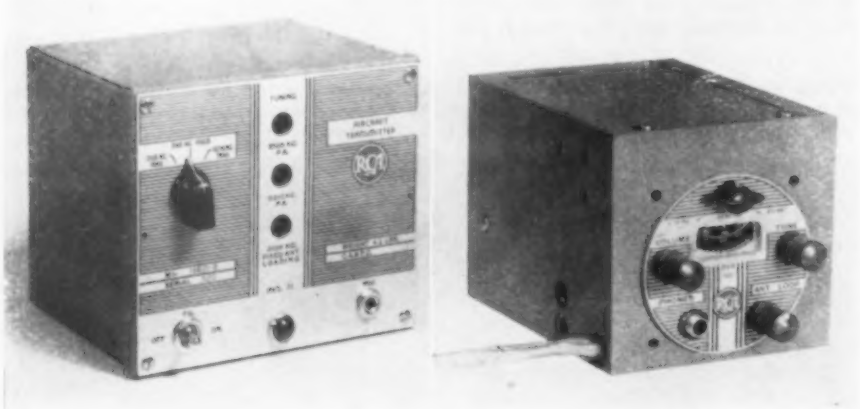
THE most important requirement of radio equipment for private aircraft is that it perform properly when required. Otherwise, it is a waste of space and weight and gives a false sense of security. Yet, it need not be too heavy or so large and complicated that it gets in the way. But it should be well constructed and large enough to do the job required of it.

Much space and weight can be conserved for baggage if the radio is fitted to the plane. For instance, why have a large, twenty-pound, three-band receiver in a two-place plane when a small, five-pound receiver will do a good job of receiving tower frequencies, enable listening to the beam between cities and also tune in broadcast stations for entertainment?

One manufacturer makes such a receiver to fit into a standard instrument hole on the instrument panel and the set has the further advantage of low battery drain tubes. This receiver is easily accessible for repairs and generally requires little maintenance; there are fewer parts to get out of order. A set of this type should sell for $50 to $60.



The Ranger Model 203 aircraft transmitter at left above weighs only 7 pounds, 5 ounces, including five tubes and built-in battery supply. A transmitter of this category should be standard for 65 to 95-hp. planes. Normal power output is 1.5 watts. Total weight of all items shown at right (excluding mike and phones) is only 19 pounds, 2 ounces.



This RCA aircraft transmitter (left) has a power rating of 6 watts but uses only 6 tubes and weighs only 4.2 pounds, excluding batteries or power supply. All tubes are or same type. The RCA receiver at right weighs only 3 pounds, 7 ounces, and its battery weighs 4 pounds and cable 6 ounces.

A larger set may be in order for a four- or five-place plane that is used for cross-country flight, especially if the pilot is in the Civil Air Patrol or if the plane may land at Army fields, since Army towers generally operate on a high frequency. Such a set would sell for about $125 to $175. This set may be a three-band receiver that covers the frequencies 200 to 400 K. C., 550 to 1600 K. C., and 3000 to 5000 K. C. Its controls are mounted on or directly under the instrument panel and control wires are run back under the floor to the battery in the rear.

The problem of reducing unwanted noise disturbances in a radio receiver increases with the sensitivity of a receiver. However, aircraft radio demands a receiver with good sensitivity. The sensitivity of a radio receiver is that characteristic which determines the minimum strength of signal input capable of causing a desired signal output. One of the first standards of any aircraft receiver should be good sensitivity. It should also have good selectivity, which means that you should be able to hear a number of stations clearly and without interference from each other.

Receivers

One standard that should be set for receivers is that there should be at least one stage of radio frequency and preferably two stages of radio frequency ahead of the first detector. This can be checked from the diagram in the cabinet in most receivers or by any radio service man. It takes one tube for each stage of radio frequency.

Standard radio receivers for aircraft should be of the superheterodyne type. The number of tubes is not always the important factor in a good receiver since several good receivers perform very well on only four tubes.

As new tubes are developed, radio sets will become smaller, lighter and more efficient. It is not impossible that one or two multi-purpose tubes will serve the minimum requirements on some future aircraft radios and do a better job than some sets today with four to six tubes.

It is desirable to have a crystal-controlled receiver as well as a crystal-

POSTWAR RADIO POSSIBILITIES

For the Private Pilot

By WILLIAM P. LEAR*

SOMETHING has happened during the war that has caused a great change in all forms of radio communication and radio navigation. It is the development of echo-type radio equipment, commonly known as radar. Radar works on the principle of sending out a signal which hits something and bounces back to the receiver. You measure the time it takes for the signal to go out and come back and you know how far away the object is. Then, if you transmit a signal on a very narrow "beam," you can also get the location of the object. As a result, you not only have the distance but the location, in terms of position.

What Radar Can Do

I think radar will have a marked effect on our aviation picture. It will solve the problem of navigation because it will serve as the eyes of the pilot. Another valuable service it will perform is the making of maps, because with it you can make a map of what's below you.

Radar has great possibilities for improving air traffic control around an airport. It is perfectly feasible and possible, and it may be in use today, to have a cathode ray tube six inches or two feet or three feet in diameter which serves as a visual indicator — radar equipment. You see little spots on that tube, and each one of the spots is an airplane. You can see how far it is from the center of the screen and you know how far out that airplane is. If you follow the spot, you can see what direction the airplane is moving. You can see if he is or isn't in the correct traffic pattern. There are also ways of identifying a plane by its spot on the tube.

The indicator on this tube can be such that you can pick up an airplane 5,000 feet high at a distance of fifty miles radius with ease. I might go so far as to say a 100-mile radius will be easy. So, if a spot is way out at the edge of the tube, that airplane is far enough away so that you don't have to worry about it. But, if you see two spots converging on the tube, you get on your transmitter and warn them.

VHF Is Wonderful — But Costly

All of this is of no help to the private pilot or to the man who is flying the airplane if he has no reliable communications. During the war, there has been great development in the "very high frequency" range of transmission and reception. "Very high frequency" means short wave length. We have learned that very high frequencies are independent of seasonal change and free of static. As a matter of fact, you can carry on very reliable communication right through a very bad thunderstorm. That means it will be possible for the itinerant aircraft of the future to have reliable performance equivalent to that of your home telephone.

*Condensed from remarks before the Aviation Writers Association.

You hear the private pilot's problem is going to be solved by postwar automatic pushbutton control. That's all right if the pilot has that much money for his radio equipment and can carry around a set of that complexity. VHF radio equipment costs about two or five times more than prewar equipment used by private fliers.

Somebody has got to pull a rabbit out of a hat before the answer to the postwar private flier's problems will be found. For a period of two years, and maybe five years, you are going to be operating both the medium and very high frequencies.

Omni-Directional Ranges

Another postwar development concerns a system of omni-directional ranges, developed by CAA. This, I feel, will eliminate the necessity for direction finders aboard the aircraft. It provides a range signal which gives you a means of determining whether you're on or off course. For example: You're some place in Indiana, and you tune in Chicago. You adjust a little dial that turns through 360 degrees until a needle reads right in the center. The indicator shows 330 degrees. That simply means you have to fly a course of 330 degrees to go towards that station in Chicago. All you do is turn your airplane around until the indicator comes to center. Then you fly a "beam" to the station. This is preferable to a direction finder from the standpoint that if you have wind which would normally blow you off your course and cause you to fly a parabola-shaped path to the station, you can correct your angle so you will be flying a definite course on a straight line right into the station. This isn't possible on the medium frequencies. So you can see you do have some additional usefulness in VHF besides reliable communication.

Low-Cost Auto Pilot Coming

Going across country in an airplane is a great relaxation if somebody else flies it. Yet we can't all afford co-pilots. So, it looks to me like there is a tremendous need for an automatic pilot that will be extremely simple in design, light in weight and low in cost. And when that comes, you will have an airplane you can get squared away on its course while you read your maps, do your navigating or listen to a radio program. Every once in a while you will check on your general position. You will have plenty of time to do that and you will do it under conditions without the stress of having both to fly and navigate. So I say you've got to have automatic pilots in your personal cross-country aircraft, and I repeat they must be extremely low in weight, they must be low in cost, they must be simple in design and require very little servicing. That is one of the contributions our company hopes to make to the picture. ★ ★ ★

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controlled transmitter for maximum stability and such receivers may become standard.

The best quality parts obtainable should be standard for aircraft radio. Condensers, resistors and insulation should stand temperatures from minus 50 degrees to plus 125 degrees Farenheit without deterioration and aircraft radio sets should be moisture proof. Condensers should be hermetically sealed.

Radios in private planes are not generally required to give continuous service for long periods of time except on special service such as Civil Air Patrol active duty, in which case heavy duty equipment may be specified or duplicate sets may be desirable in the event that radio contact is a life and death matter over rough terrain, over water and through fogs. In the event duplicate sets are specified, one should be powered by portable "B" batteries and one from the regular plane battery with a vibrator power pack supply, to insure radio reception should one type of power fail.

Transmitters

A radio transmitter is essentially an assembly of radio parts, condensers, resistors, coils, power supplies and the like for producing power at radio frequencies which is delivered to an antenna and is controlled or modulated by the intelligence to be transmitted.

Its assembly of parts includes the frequency controlling device, which is a quartz crystal oscillator in aircraft radio, the D. C. power supply and various amplifying stages. These components are assembled in a steel cabi-

net containing the various switches, controls and meters that are necessary for adjusting the transmitter and monitoring its performance.

A transceiver is essentially a combination receiver and transmitter in one cabinet, using the same tubes and parts for both transmitting and receiving. It often produces interference since the receiver may radiate and cause a howl in another nearby receiver. A transceiver should be the very minimum for cross-country trips but cannot be relied on for very great distances.

The frequency tolerances of transmitters are regulated in this country by the Federal Communications Commission. A very high degree of frequency stability is necessary for technical reasons alone. The frequency tolerance for aircraft transmitters in the high frequency range is .025 per cent and .1 per cent in the low frequency range.

No one is allowed to make adjustment or repairs to an aircraft radio transmitter which may affect the frequency unless he has a second class (or higher) commercial radiotelephone operator's license but adjustments may be made by others in the presence of or under the supervision of the holder of such a license.

This means that the private pilot, who generally only has a restricted radiotelephone operator's permit, may not legally change the crystal in his aircraft transmitter or make repairs which could affect the frequency except under the supervision of a holder of a proper type commercial radio operator's license.

Tube Types

As far as possible, both receivers and transmitters should incorporate tubes of the same type numbers so that it will be less likely to get tubes mixed up after they have been removed for testing. Some manufacturers have satisfactory equipment using all 6V6 or all 6L6 tubes. In any event, it should be standard practice to stamp the tube type numbers on the sockets of all equipment.

No standards can be specified on the life of tubes but an old tube that still tests good on a tube tester may perform as well as a new tube, if the old tube is not microphonic or gassy. Tube testers will not show when a tube is microphonic but the receiver can be slipped out of the panel and with the power on, tuned to a spot on the dial where there is no station. Then, if there is a musical sound when the tube is tapped, the tube is probably microphonic. Some tube testers have no method for testing gassy tubes. If in doubt, it is best to replace the tube. However, it is well to keep in mind that tubes may last for years when the set is not in continuous service. A blue haze between the elements of a tube indicates the presence of gas, which will cause erratic performance. Metal tubes are best for aircraft radio since they are better shielded and should be standard equipment.

Antennas

The radio manufacturer should furnish the proper type antenna with the radio equipment and give instructions for mounting it in the most suitable place, according to factory tests, since the antenna is one of the most important parts of the radio system.

The loop antenna is standard for direction finding radio equipment since it is a directional antenna in any direction and can be used to follow the signal of any broadcast or other radio station to its source near a city. Both a loop antenna and a standard receiving antenna are desirable for cross-country flights.

Some visible method should be provided for tuning the antenna circuit to provide a proper match when the plane is on the ground and also at different altitudes, since the antenna power-gain ratio changes at different altitudes. This method may be a radio frequency antenna ammeter, which would add at least ten dollars to the cost of the set, or it may be a neon bulb near the antenna tank circuit, which is inexpensive but not as effective a tuning indicator.

Antennas should be sturdy enough to withstand above-average speeds and be as rust-proof as possible, preferably chromium plated. The antenna should have a co-axial cable lead-in, and capable of being mounted on the plane without shorting out and should be mounted as far away from the motor as possible to get away from noise pick-up. Spark plug suppressors should be standard equipment on most planes.

The loop antenna is standard for direction finding radio equipment since it can be made directional but either a fixed antenna from the cabin to the tail or a whip antenna will be suitable for most receivers.

Power Supplies

The most desirable type of power supply for aircraft radio is a lightweight, rechargeable, portable style B battery such as was manufactured by at least one company before the war. The price of such a battery was around ten dollars and it had a long life with practically no shelf aging. Such a battery should be standard equipment for receivers on small planes, since it is rechargeable and uses no power from the plane's storage battery. Ordinary B batteries will last longer if used for short periods every week, at least, rather than allowed to stand without use for months. B batteries should be checked every month to see whether they are deteriorating, since deterioration will eat into the metal case of the radio equipment. When materials are available, it should be standard practice to build leakproof batteries for aircraft radio. B batteries are always tested with a direct current voltmeter. A pocket size voltmeter can be reasonably purchased and is a very handy instrument to keep in the plane for testing batteries, testing for shorts and checking other instruments.

The vibrapack is probably the most satisfactory type of power supply for small transmitters, and should be standard. But for the large-type transmitters, a motor generator should be specified to supply more voltage at greater current. A genemotor is generally unsatisfactory. A vibrator cannot be satisfactorily repaired by the average serviceman when the contacts of the vibrator are burned or stuck, and it should be standard practice to install a new vibrator when trouble occurs. Only the factory has the equipment to set the points so that the vibrator will perform for any length of time.

Mounting Equipment

It should be standard practice for the manufacturer to provide a fused, shielded lead from the switch for the radio installation. Such a lead can be much more easily installed at the factory. Enough space should be left under the seats to mount radio equipment and the seat cushions should be removable so that the radio equipment can be serviced with a minimum of effort. All wires should be as short as possible and it is a good practice to bond the shield of the cable to frame bolts every few feet. It should be standard practice to shock-mount all radio equipment with rubber padded mountings.

Instruction Manuals

It should also be standard practice to include a complete instruction manual with all aircraft radio receivers, preferably one that can be clamped to the receiver itself for ready reference. This manual should be small in size and include full instructions for the installation and maintenance of the particular receiver. Such a manual should list each part of the equipment by number and price so that the radio serviceman can order replacement parts without entering into correspondence with the factory.

(Continued on page 68)

Canopy Conversion for the Fairchild PT-19

Here are details covering installation of a Fairchild canopy on the popular PT-19, as outlined by the company's service manager. The canopy price: $971.37, FOB Hagerstown.

WITH surplus buyers acquiring more and more military primary trainers, much interest has been shown in the Fairchild PT-19 series, of which 3,725 had been declared surplus and 542 sold as of March 1. An interesting development has been the modification of numerous PT-19's by installing a canopy to enclose the open cockpits.

Kent Bradford, service manager of the Fairchild Aircraft Division, tells SOUTHERN FLIGHT he still has some of the canopies in stock for immediate delivery. The list price is $971.37, FOB Hagerstown, Maryland. That's pretty expensive, but Fairchild is considering, he says, the redesign of the canopy to increase the ease of manufacture and reduce the price.

"Aircraft Specification 724 covering the M62 canopy allows the PT-19 to be licensed without any change in the aircraft with the exception of assuring that specified center of gravity limits be adhered to," Bradford pointed out, adding that a number of canopies had been at the factory. There is no effect on the flight characteristics when the canopy is installed, although it provides a smoother air flow.

Bradford explained the PT-19 canopy installation as follows:

The complete canopy when crated for shipment has been assembled so that there are few details that have to be installed separately. With each canopy is furnished a blueprint to be used for installation purposes.

To make the installation it is first necessary to remove the cockpit deck and the turtle deck from the fuselage of the airplane back to Station 6, or the rear of the baggage compartment, leaving the baggage compartment floor intact, and removing all trim fairing in the two cockpits so that the canopy assembly will sit level on the wood fairing strip covering the top longeron. The crank bracket has to be relocated because of the change in the door opening through the baggage compartment.

The easiest method in installing a canopy is to place the rear sliding portion on the tracks and slide it back over the rear windshield and place on the airplane as one piece. The metal fairing should then be placed over the turnover structure and the center section of the canopy put in place over the cowling. The front sliding section is then put on the tracks and slid back over the center section. The front windshield assembly can then be put in place.

All of the major parts of the canopy are now in place and can be lined up so that the entire installation sits firmly and squarely on the airplane. Care should be taken to see that the sliding portions close firmly against the front windshield and center section and work freely on the tracks. When this has been accomplished the entire assembly can be bolted securely to the clips.

A flexible cable is then threaded over a series of pulleys and tubing conduits and fastened at each end of the tracks. This cable is to prevent the sliding portions from being thrown out of line in opening or closing and assures a smooth operation. They should be adjusted so that the sliding portions will travel freely without undue strain and still control the travel of each side with uniform motion.

There is a lock provided about one-half way up on the left hand side that will hold the canopy of the sliding portion in three positions: fully open, fully closed and open about two inches for ventilation, if desired, in flight.

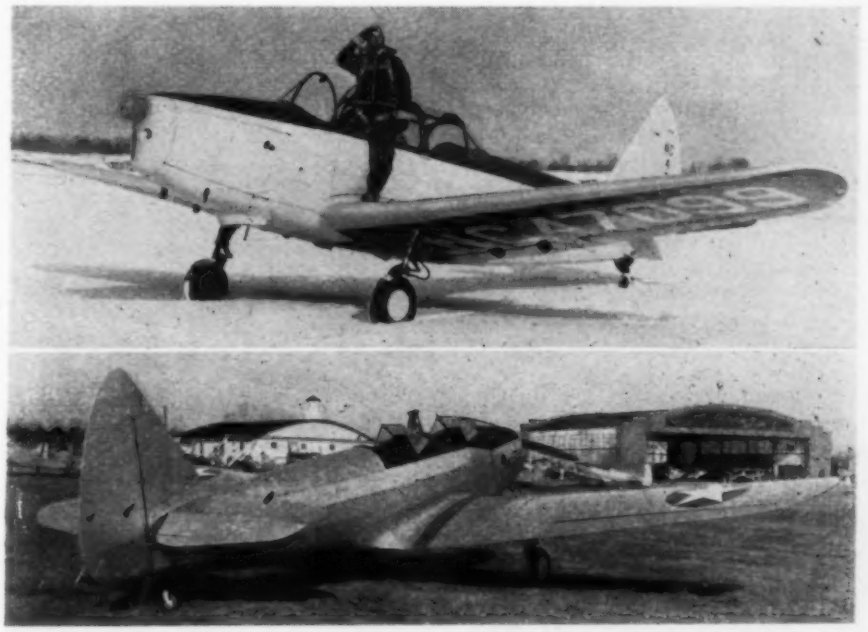
Fairchild's PT-19 is one of several aircraft in the company's M62 series. The variations, with horsepower and military designations, are as follows:

PT-19: Model M62, 175-hp. Ranger 6-440-C2.

PT-19A and PT-19B: Model M62A, 175-hp. Ranger 6-440-C2 and 180-hp. Ranger 6-440-C3.

Model M62B (no military designation): 165-hp. Warner Super Scarab.

PT-23: Model M62C, 220-hp. Continental W-670-16. ★ ★ ★



Before and after views show conversion of 175-hp. Fairchild PT-19, with open cockpits and Army paint job (lower) and canopy and civilian paint (upper).

Production Engineering

Key to Lower Costs

The experts agree that costs must drop if postwar personal flying amounts to much. Here's what one company is doing about the problem.

By GEORGE E. HADDAWAY

WHEN Republic Aviation executives arrived in St. Louis last December for the NATA convention and trade show, they announced their postwar "Seabee" amphibian and tagged it with an estimated retail price of $4,000. Many old-timers stuck their tongue-in-check, raised a skeptical eyebrow and allowed it couldn't be done.

One weather-beaten remnant of the hamburger days epitomized the general reaction with this dour observation: "Some more of that postwar eyewash the pipe smokers have been handing out lately — looks like an 8,000-buck job to me."

We'll admit we were skeptical, too. The Republic "Seabee" is a lot of amphibian for the money: 175 horses, four-place, retractable landing gear and all the trimmings. On several occasions we attempted to find out from the engine manufacturers what horsepower might cost in the postwar days and they were frankly pessimistic. Likewise, because of the great unknown — labor costs — the accessory manufacturers got cagey when the matter of price was mentioned.

While our personal skepticism was tempered somewhat by the knowledge that Republic has sliced airframe costs of the P-47 consistently and voluntarily as production shot up, even so, we thought, there's not much room for comparison between building "Thunderbolts" for Uncle Sam and producing personal airplanes for the competitive postwar market. How, then, could Republic hope to sell so much airplane for so little money, and why didn't the postwar-price-of-labor bugaboo frighten the "Thunderbolt" makers? These were the questions in December.

In February the bomb-shell hit. News got around via grapevine telegraph that Republic had been a little high on the first price estimate and now it looked like the "Seabee" would retail for $3,500!

This was the last straw. Somebody was nuts. Maybe it was me and the old-timer at the NATA convention. Last month I found out. I went direct to the Republic Aviation Corporation at Farmingdale, New York, and got the story. I came away convinced that the "Seabee" will retail for $3,500 if Republic president Alfred Marchev says so and furthermore, I won't be surprised if after the first year he sends every purchaser a $100 rebate!

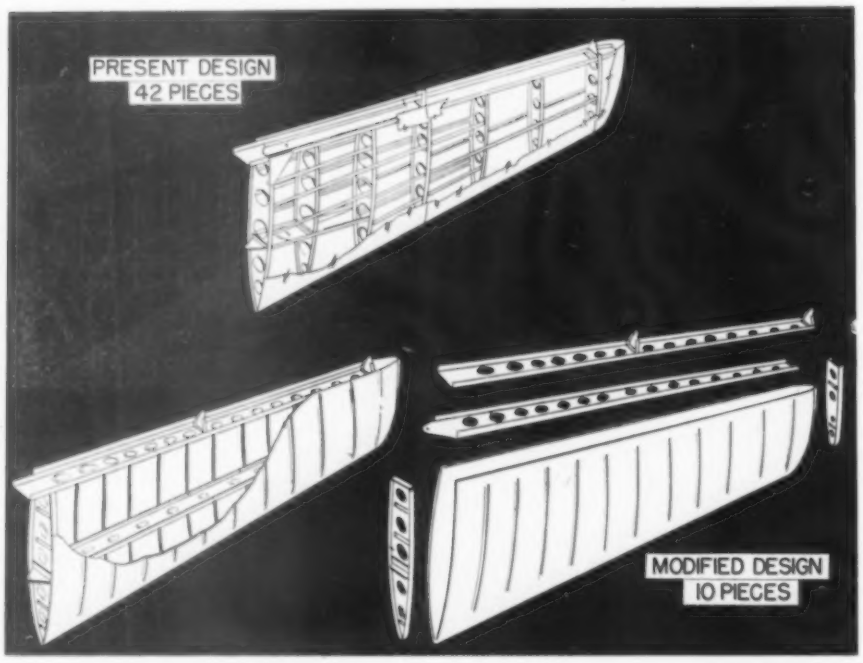


Fig. 1—Stabilizer

Fewer Parts Mean Lower Costs

Fred Marchev's approach to the problem of paring manufacturing costs isn't complicated. There's no magic involved. It's simply a case of engineering production — cutting down the number of pieces and parts that go into an all-metal structure, which means a reduction in fabricating time and effort, which in turn is money. For the first time in history, the aircraft manufacturer can afford to spend some money on production engineering. Heretofore, Marchev points out, a company would design a new airplane so that the experimental department could build it largely with hand labor and without tooling up. If the design clicked, then all subsequent airplanes were built much the same way as the prototype. The industry merely added on more people and put more machines to work.

Today, however, on the brink of a new era, Mr. Marchev believes we've got to throw the old methods out the window and start all over. We must cut costs to get volume — not wait for volume sales to bring costs down. We must find new simplicity in design, in construction and in fabricating technique and take full advantage of the valuable lessons learned in all-out war production. The first step is adequate engineering for production.

Last year Fred Marchev gathered three of his engineers together and told them what he wanted to accomplish with the airframe structure of the "Seabee." The objective was to develop a design which would fill the following requirements: strength-weight ratio equal to or better than conventional aircraft design, and maximum fabricating economy con-

sidering tooling, fabricating man-hours and labor.

Throwing all precedent away, the engineering group started from scratch with the stabilizer. They began to eliminate ribs and other parts. They "crimped" the aluminum skin to achieve greater strength. After months of burning midnight oil they succeeded in reducing the number of parts from forty-two to ten. In its static tests the new stabilizer satisfactorily supported 110 per cent ultimate load. Their accomplishment is vividly illustrated in Figure 1.

Following this initial success, hard-boiled cost accountants were brought into the picture. Figure 2 graphically reveals the impressive saving in time required to manufacture the modified stabilizer design with improved tooling as compared to the present design and today's tooling.

Figure 3 shows the amazing results of similar experimentation with the lightplane wing structure, also utilizing the "crimped" skin cover, with a reduction from 134 component parts to only twenty-one. Two fifty-inch wing test panels were designed, constructed and static tested, one with three spars, beaded skin and end ribs, the other with four spars. Intermediate ribs, stringers and reinforcements were omitted.

In the static tests of the wing panel, the HAA (high angle of attack) condition withstood 115 per cent ultimate load, and the LAA (low angle of attack) condition withstood 110 per cent ultimate load. The torsion tests proved the modified design to be four times stiffer than the minimum CAA requirements for fabric covered wings, and proportionately 70 per cent as stiff as the Republic "Thunderbolt" wing.

The "Thunderbolt" vertical fin was run through the same experimental mill. The engineers ended up with six different designs. The one finally chosen had only thirteen parts as against one hundred in the original. It was not only 20 per cent lighter in weight but cost accounting figures show it can be built for approximately one-sixth the cost of the present fin.

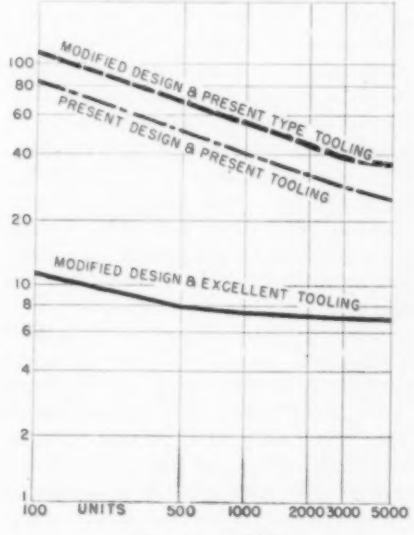


Fig. 2—Stabilizer
Minutes per lb., direct labor comparison.

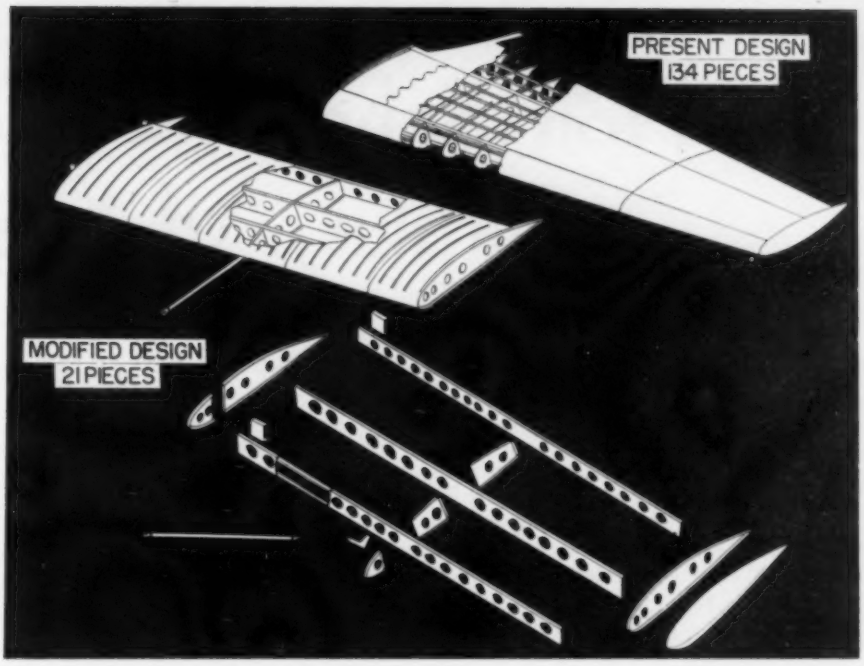


Fig 3—Wing

Work is rapidly going forward on the fuselage structure, shooting for the same production engineering objective — the minimum number of parts and the minimum number of fabricating man-hours both in detail and assembly time. The goal for the hull is one-third the present cost.

The Republic president is confident they'll do it without any compromise of strength or quality; for cutting costs must not be confused with "cheapness." The important thing to remember is: when you eliminate parts you cut everything—material, labor, machinery, time and overhead.

Only a Starter

To Fred Marchev, his company's production engineering efforts toward developing a line of postwar airplanes the average citizen can afford are merely the beginning. Republic is busy building "Thunderbolts" right now and its personnel, as in the case of all war contractors, can work and experiment on postwar developments in their spare time only. But at Republic they've gone far enough to be sure of the ground they're walking on. When people tell Fred Marchev he can't possibly sell the "Seabee" for $3,500, he smiles patiently, then quietly informs them he hopes to get the price down to $2,200 a couple of years after the war — the price of the medium class automobile. With the "Seabee" only one of several designs being considered by the company (a $1,200 two-place job is also in the works), the production engineers and cost accountants are convinced that airframe costs on any all-metal design can be reduced to below $1 a pound. The lowest priced light plane before the war, largely fabric covered wood and welded steel tube construction, cost somewhere in the neighborhood of $3 a pound. For designs comparable to Republic's all-metal airplane, the costs were eminently higher.

The Republic head believes the same engineering production principles can be applied to aircraft engines. Instead of engines at $4.50, $5.00 or $6.00 per horsepower, Mr. Marchev believes the postwar small plane power plant should sell for below $3.00 a horse.

As for instruments and radio, he accepts the view that here, too, prices must be slashed. In his opinion we must get away from the idea that an airplane for the average owner must have a highly sensitive precision ammeter when a fifty-cent automobile type will fill the bill by telling the pilot whether or not his battery is charging, not how much to the milliampere. Airplane tires should not cost any more than automobile tires and postwar volume orders should see a sharp reduction in all such items and accessories for the private owner type airplane.

Other money saving short-cuts are coming. Republic has devised, per-

(Continued on page 68)

Private Flying Roundup:

The Non-Scheduled Hearing; Surplus Ad Misleads Public

SOME of the answers to some of the questions raised by the Civil Aeronautics Board over the growing importance of non-scheduled air service were obtained at hearings conducted in Washington late in March. But the impression gained by some of the operators who participated was that much study and investigation remains to be done before anything should be done by CAB in the way of definite action.

The purpose of the investigation was to ascertain if any or all of the economic regulatory provisions of the Civil Aeronautics Act should be made applicable to those common carrier air transportation services generally referred to as "non-scheduled".

The non-scheduled operators themselves told the Board, in a statement presented by Col. Roscoe Turner, president of the National Aviation Trades Association, that additional regulation was neither necessary nor desired. Non-scheduled services do not conflict with the role of the scheduled operator, Sheldon B. Steers, Michigan's aeronautics director and president of the National Association of State Aviation Officials, said. He cited a survey showing that 88 per cent of the passengers handled in non-scheduled operations in Michigan were traveling intrastate, and 87 per cent of their trips were within that state. Similar percentages were produced from a Pennsylvania analysis, he said. Arthur H. Tully, NASAO vice president and director of the Massachusetts Aeronautics Commission, emphasized that non-scheduled operators do not need Federal regulation and should be controlled, if it ever becomes necessary, by state authorities.

Airlines Ask Regulations

The airline industry was represented by numerous speakers, all attempting to prove the need of regulation covering non-scheduled services. A. H. Near, Kentucky Aeronautics Commission secretary, charged flatly that the airlines' demands for additional regulation is an effort to hold down private flying. Stringent regulatory legislation enabling CAB to clamp down on non-scheduled services was recommeded by Dr. Lewis C. Sorrell, the Air Transport Association's research director. He wants regulations which would make contract air carrying illegal without CAB "permits", require official filing of minimum charges by operators, and require filing of periodic records by non-scheduled carriers providing accounts and statistics on operations. To him and others representing the airlines, non-scheduled operations are becoming more and more competitive with the airline industry.

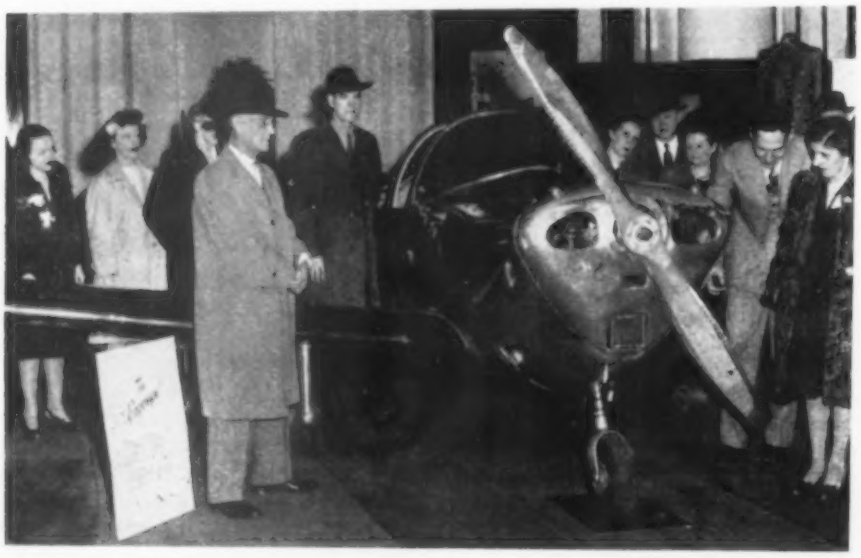
But the United States Chamber of Commerce, represented by Col. A. B. Barber, manager of its transportation and communications division, appealed for no restrictive regulations, and William T. McCracken, speaking for the National Aeronautic Association, urged postponement of any CAB action because non-scheduled regulations now would be premature. Speakers taking this view contended all forms of aviation, particularly non-scheduled and contract carriers, should be encouraged, rather than restricted, to guarantee full development immediately following the war. Then, if economics and safety are abused, regulations can be considered on the basis of actualities rather than theory.

It was apparent that several months will be required for the CAB examiners to analyze all testimony submitted, plus briefs which are to be filed.

Misleading RFC Ads Criticized

Price-tagging of surplus primary trainers replaced bidding in RFC sales scheduled on and after April 6, but the surplus handlers were receiving criticism charging misleading representation of the PT's. What drew fire was the way the airplanes were advertised in newspapers throughout the country. The ad said in part: "Government planes now for sale. Surplus property available April 6, 1945. $875 to $2,400 depending on condition. Average cost new to Government approximately $9,000. Approximately 3,000 primary trainers meeting rigid Army and Navy specifications to be offered for sale on a price tag basis by Reconstruction Finance Corporation."

That pictured a pretty good deal, giving the impression that a person could buy an $875 airplane and begin flying immediately. Actually some of the buyers will have to spend several hundred dollars on repairs and improvements before CAA requirements can be met, despite the RFC's statement that the airplanes already meet "rigid" Army and Navy specifications.



ERCOUPE DISPLAY IN DEPARTMENT STORES, as shown above at Block's in Indianapolis, has brought inquiries from all over the country. The sponsor of the Ercoupe display, Parks Air College, Inc., has shown the plane in Chicago and Indianapolis and plans to display it at Kansas City and Birmingham stores. Results have been good, nearly 200 Ercoupes having been sold in the two cities already visited, and many prospects having been secured.

A resolution prepared in Washington by the CAA's new advisory committee on non-scheduled aviation said the RFC's method of disposal is "unfair in its concept, uneconomical in its operation and objectionable in its fundamental basis of engaging the government in a business directly competitive with established private industry." The committee urged initiation of a program "whereby the established and organized sales facilities of the industry be utilized in the disposal of only such surplus aircraft as are certifiable with or without moderate repairs and alterations."

Are WTS Planes "Surplus"?

A discrepancy continues in the manner of reporting surplus aircraft sales. According to the Surplus Property Board, which issues periodic summaries of sales, a total of 7,284 surplus civilian type planes out of a total of 10,550 declared surplus had been sold as of March 1. But included in that figure of planes sold are 5,360 planes which had been used by the CAA's War Training Service. The question is this: When did WTS planes become "war surplus"? They had been built before the war and were owned by individuals until requisitioned by the government. They do not represent war production at all. Yet 5,399 WTS planes are listed as having been "declared surplus" and 5,360 of them have been "disposed as surplus." Thirty-nine are still "on hand" with the surplus pool.

Discounting the WTS planes, the total of surplus sales of civilian type planes as of March 1 was only 1,924, out of a total of 5,151 declared surplus. Other surpluses and sales as of that date including the following: single engine primary trainers, 872 sold, 7,244 on hand; basic trainers, 1 sold, 6,150 on hand; single engine advanced trainers, none sold, 340 on hand; two engine advanced trainers, 2 sold, 2,786 on hand; single engine reconnaisance, none sold, 126 on hand; 1,829 single engine liaison sold, 1,120 on hand, and single engine utility cargo, 79 sold, 111 on hand.

Rural Market Tops

Rural dwellers will account for nearly 60 per cent of the postwar lightplane purchases, and another 10 per cent will be bought by suburbanites, thus leaving only 30 per cent of the sales to the cities. So says Aeronca Aircraft Corporation following a survey of the market. John W. Friedlander, Aeronca president, said rural dwellers have "ample landing facilities" if they live on a farm or on the fringe of a community, "practically ready-made hangars" in their barns and sheds, and they can use lightplanes for "planting seed, dusting crops, flying the range, obtaining repair parts quickly, and dispelling isolation by getting from 'nowhere' to 'somewhere' rapidly."

CONTROLLABLE WING FEATURES NEWEST PLANE being tested by Consolidated Vultee Aircraft Corporation's Stout Research Division at Dearborn, Mich. The radical wing, 26 feet 6 inches in length, utilizes the principle that a wing may be moved relative to the airplane around two pivots in such a manner as to give control without separate control surfaces being used, thus eliminating ailerons, elevators and rudders on small planes. Over 100 hours of flying have been logged in the odd craft by its designer, George Spratt, who doesn't know how to fly a conventional plane. No specifications or details have been given, but the engine is mounted behind the pilot, with an extension drive to the propeller on the tail fin. Roadabiliy is indicated by its four wheels and the possibility of turning the wing lengthwise instead of removing it. The company emphasized it may take several years to perfect the principle.

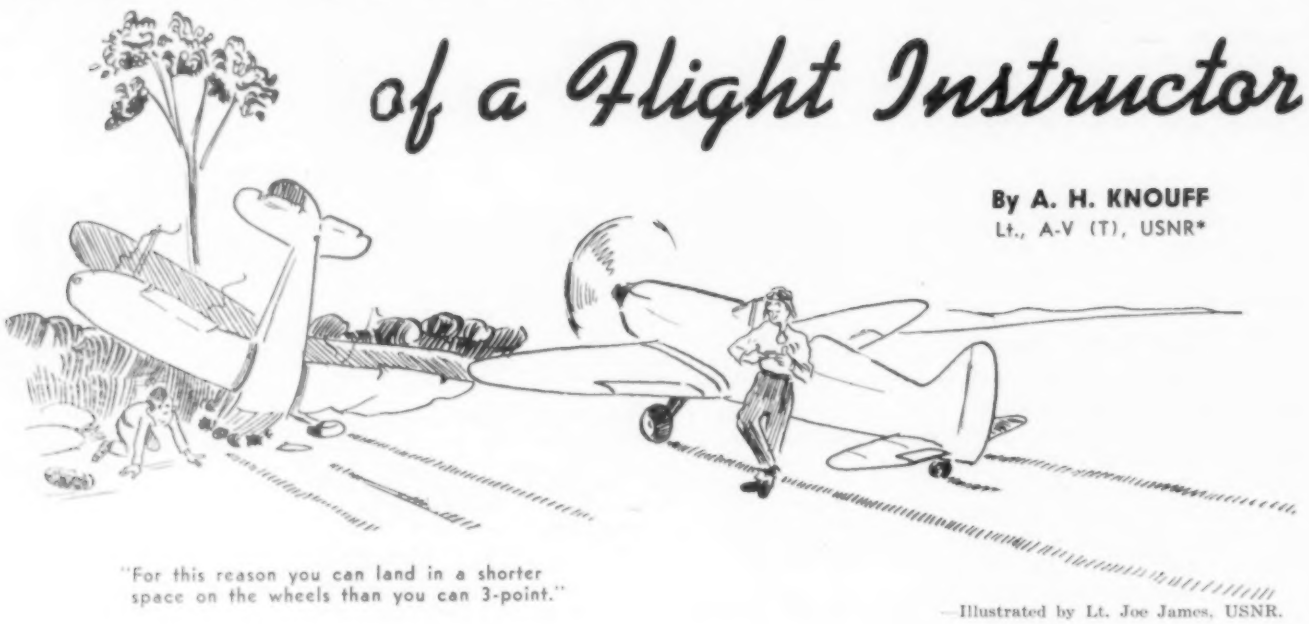
Priorities for Personal Planes

The Aircraft Division of the War Production Board is lining up civilian customers who want to purchase personal planes. The requests are divided into three priority groups, and WPB officials will use their judgment to determine who needs a plane most, then assist the manufacturers in giving priority deliveries. All this means government control will be continued during the transition period between all-out war production and full-scale peacetime production. . . . CAA field personnel report a "small-sized boom" in civilian flight instruction. More than 51,000 student pilot certificates were issued in 1944, as compared with less than 35,000 issued in 1943 to students outside of the War Training Service. Most of the students are youths between 16 and 21 who hope to use the training in the war effort and men over 30 who plan to fly in their business, with the older ones, including doctors and priests, farmers and salesmen. . . . L. C. Elliott, CAA regional manager at Fort Worth, says the number of designated landing areas in his region has increased from 195 on January 1, 1944, to 251 on January 1, 1945, and most of them are in outlying towns where there has been no previous aviation activity.

A blow to non-scheduled flying on the West Coast comes in the form of Navy orders reinstating former restricted areas made by the Army in Dec., 1941, recently relaxed. Especially affected will be the metropolitan areas around Los Angeles, San Diego and San Francisco. Transient airmen will be permitted in and out of the areas on approved flight plans but miscellaneous operations will be pushed back in or near the desert country. West Coast plane owners and operators are fighting mad at the new order because of their investments during the brief respite which followed the Army's decision to relax restrictions along the coast. . . . Bill Matthews dropped in at press time from Wichita with the news that the CAA has approved the twin-engine (UC-78) Cessna for approved type certificate and Cessna will start producing reconversion kits expected to sell for around $100. . . . Cody Laird has disposed of his interest in Southeastern Air Service, Inc., and has resigned as president of the company. Laird has acquired an interest in the Robert E. Martin & Company, Atlanta advertising firm specializing in aviation accounts which include the Southeastern company. Laird's interest has been purchased by Ben T. Smith, former vice president in charge of fixed-base operations, who assumes the presidency. Laird will retain the presidency of Southeastern Air Express, Inc., for an extensive feeder line operation throughout the southeastern states. ★ ★ ★

CONFESSIONS of a Flight Instructor

By A. H. KNOUFF
Lt., A-V (T), USNR*



"For this reason you can land in a shorter space on the wheels than you can 3-point."

—Illustrated by Lt. Joe James, USNR.

PART VI

"I BET I could fly one of those things, if I just didn't have to land." If each instructor had collected a nickel every time he heard that statement, he could have eaten more regularly. Occasionally I did make it pay off by betting that the speaker could not even taxi the airplane to the take-off position.

On the other hand, I know at least one case in which a passenger on his first ride landed a large conventional airplane himself. The pilot, Maj. Dave Young, aviation manager for the Purol Company at that time, fell out of an O-38 when his belt came unfastened in a slow roll. The ship did a split-S and almost hit him as his parachute opened. I am sorry that I cannot remember the name of his passenger, a ground officer, whom I met only once. Anyway, he let the airplane alone while he tried to remember everything he had ever heard about flying. When he got it reasonably straight and level, he did some more thinking and experimenting with the controls. Finally he made a pass at the Columbus, Ohio, Municipal airport, then flew around thinking some more. After several passes, he finally landed so well the linemen thought he was crazy when he asked for a pilot to fly the airplane back to the Ohio National Guard field for him.

Emphasis on Wheel Landing

Although a large number of accidents occur in landing, they are far less dangerous than figure-8's. The sooner a student realizes that landing is no more difficult than anything else, the easier the instructor's job will be. My theory is that the quickest way to cure his fear of landing is to let him make one as soon as possible. I usually talk a student into a landing (working the rudder myself without his knowledge) on his first lesson—with surprisingly good results.

The three-point landing is the sacred cow of aviation. By that I mean that it is worshipped by some pilots as the acme of perfection. Yet I know of a badly needed fighter plane sitting in the repair shop right now because the pilot made a three-point landing at the wrong time.

When wheels replaced skids on the early planes, the problem of slowing down had to be solved. Increasing the angle of attack on the ground and dragging the tail offered a solution.

"I bet I could fly one of those things if I didn't have to land!"

When tailwheels replaced skids, the problem was met by installing brakes. With the advent of brakes on even light planes, much of the necessity for three-point landing disappeared.

Many pilots think that there is less danger of nosing over when the brakes are applied if the tail is not on the ground. Actually you can use the brakes sooner and harder in a wheel landing because you still have control of the tail. For this reason you can land in a shorter space on the wheels than you can three-point. Try it yourself, *but remember that as the ship slows down, you must ease up on the brakes*—and it will slow pretty quick.

If I seem to over-emphasize wheel landings, it is because I think they have been under-emphasized in the training and experience of most pilots. A good golfer must know how to use all his clubs and when to use each of them.

It is easier to teach three-point landings first because the technique is simpler. The pilot just keeps pulling back on the stick until the airplane won't fly any more. If he lands a little too high, the airplane may hit the ground pretty hard, but it will stay there. All he has to do is hold the stick back and keep the plane rolling straight.

On the other hand, if he hits on the wheels, the bounce will tend to throw the nose up. So he must relax the back-pressure on the stick—or even push it forward—to keep from bouncing too high. It is easier to make a good landing than to patch up a bad

*Opinions and assertions herein are the author's, and are not to be construed as official or reflecting the views of the Navy Department or the naval services.

one because the latter requires faster thinking and action. Therefore, it will usually be safer for the beginner to go around and start all over again. But be sure you teach him to hold the nose down when he opens the throttle.

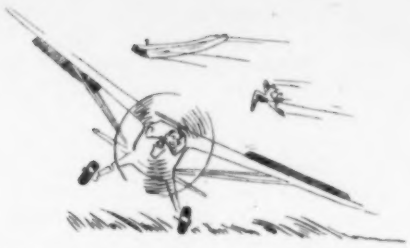
A landing really begins when the gun is cut for the approach. Too much or too little speed, a poorly planned flight path, or breaking the glide at the wrong altitude will complicate the landing. Last minute adjustments may be too much for the beginner.

The most common error is flying the airplane into the ground. To correct it, the student must be convinced that he does not have to "put" the airplane on the ground with great precision, but must try to keep it off the ground and it will land itself. I often tell a student to land two, five, or ten feet high—increasing the figure if he continues to bounce. If he can't make himself do it, I demonstrate a full stall from about five feet (which seems like ten to him). On his next landing he will usually drop in at about two feet. Landing tail first is the lesser of two evils for beginners.

A student must know how to recover from a bad landing before he soloes. Most students will show a general trend of improvement — a series of landing too high, then too low, and too high again, but each time closer than before—until they make a few good landings. Then they appear to go haywire. At this stage, the instructor must exercise all his willpower to stay off the controls. Now is the time for the student to learn that he is on his own and must correct his own mistakes. He will appear to become progressively worse, but his errors will not really be as great as they were in earlier stages. They will simply be more apparent because he knows he is making them —and the touch of the master that was necessary in the beginning, is no longer given.

If he does not go into this "pre-solo slump", the instructor must make him do it. Anything that will throw him off stride will serve the purpose. Talking to him just before he lands or cutting the gun several times in succession are examples. After he has patched up a few bad landings—or gone around on his own initiative—and has started to improve again, it is time to solo him.

A wheel landing might be described as the correction of a bounce, developed to perfection. The pilot anticipates the wheels striking the ground and changes from back pressure to forward pressure quickly enough and hard enough to completely overcome the force that would produce the bounce. It may surprise you that—far from any tendency to nose over—the usual error is to apply the forward pressure too little or too late, and to let the tail drop too soon. This causes bouncing or "porpoising".



"I have seen students land Cubs in 40-mile gusty cross-winds . . . safely . . . because they had been taught what they needed to know to meet this situation."

Cross-Wind Landing

Another error is landing with the tail too high. The attitude of the airplane at the moment of contact should be planned to meet the particular situation—the stronger the wind the higher the tail—but never above level flight position. The tail may be raised above level flight position to hold the airplane on the ground if the wind is greater than its flying speed. Don't be afraid of using too much forward pressure when the wheels hit. It is better to apply too much too soon than too little too late.

When brakes are applied, and as the airplane slows down, back-pressure will be relaxed—but the stick should continue to move forward until the tail is on the ground.

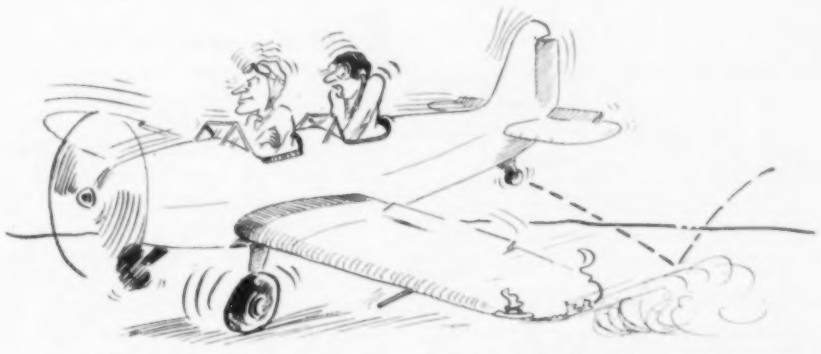
A student who learns to fly on runways or landing strips is likely to take cross-wind landings as a matter of course. One of the poorest students I have known was caught in a cross-wind on his first solo. It had been calm when he took off, and he did not realize that the wind had come up until we called it to his attention.

If you tell a beginner to fly the airplane along a straight line which is cross-wind, he will hold the airplane parallel to the line, put the wing down to keep from drifting, and hold opposite rudder to keep the ship parallel to the line. This is exactly what you want him to do in cross-wind landings. So why put them off until this instinct has been killed and then have to teach it to him?

There is really only one way to make a cross-wind landing. You can make the approach by crabbing or slipping, but before you touch the ground, the longitudinal axis of the airplane must be parallel to the direction it is moving. The only way this can be done is by slipping into the wind. If a crabbing approach is continued too close to the ground, the pilot must kick the plane around straight and push aileron to hold the windward wing down. He may be too slow or not apply enough correction. On the other hand, if the slip is established during the approach, the student has plenty of time to do it correctly.

The moment the airplane touches the ground, forces come into play which require *increasing* the amount of control already in use. The wheels establish a pivot against the force of the wind pushing on the side of the plane. The windward wing tends to come up and the tail tries to weathervane. It will probably take full aileron to windward and full opposite rudder to overcome these forces. Incidentally, the drag of the aileron on the lee wing will help keep the ship straight even after it has lost its effectiveness in controlling the wings. Because of all this, there is almost no such thing as over-correction for a cross-wind. One thing you must watch for is that the student may become so engrossed in cross-wind technique that he will correct for a cross-wind when there isn't any.

Detecting drift seems to be a mystery to some pilots. Sighting some point over the nose is not good because the pilot may keep turning the nose to line up with the point and wind up



"Then they appear to go haywire. At this stage, the instructor must exercise all his will-power to stay off the controls."

drifting worse that he started. Drift can easily be detected when landing on a runway because the edge provides an excellent reference line. All you have to do is keep the longitudinal axis parallel to the edge of the runway. Landing on grass, gravel, or even apparently smooth pavement, the irregularities of the surface will appear to form lines parallel with the direction the airplane is moving. When these apparent lines are parallel with the longitudinal axis, the airplane is not drifting.

Since the axis is an imaginary line, the student will usually use some real line such as a seam in the cowling, or the sill of a window for comparison. You can show him how the ground should be moving in relation to this line by calling it to his attention while taxiing straight.

Many instructors do not place sufficient importance on keeping an airplane straight on the take-off or landing runs. Perhaps I am a crank on this point because, early in my experience, I flew under conditions where it was imperative. Since none of my students has ever so much as scraped a wing-tip, it must be worthwhile.

The practice of making touch-and-go landings before solo may be a costly time-saver. Some of the instructors with whom I have worked openly ridiculed my insistence that students roll to a full stop (without using brakes) and then taxi laboriously back for another take-off, but one by one they become as sold as I was on this slow-but-sure procedure—when their students had landing accidents and mine did not.

I had begun to think one student would never learn to keep the airplane straight on take-offs or landings. One day, instead of giving him the prescribed lesson, I told him to go out by himself and taxi around the field for an hour, keeping the tip of one wing exactly five feet from the fence. It worked. I was able to solo him on his next lesson.

On one field the runway lights stood two or three feet above the ground. I made my students take off and land with the wing-tip two feet from these hazards. They *had* to learn to keep it straight. They may have thought I was a crank then, but many of them have later thanked me for being one.

I have taught flying in one-way fields between the hills of the Ohio valley where students had to learn cross-wind landings before they soloed. I have instructed on the 7,200-ft.-high field at Laramie, Wyoming, where a Luscombe landed like a pursuit, and which is officially the windiest airport in these United States. I have taught on the deserts of the Southwest where the air is hot, thin, and the gust treacherous. I have *had* to learn, and to teach my students, all the tools of the trade and how to use them individually and in combination.

I have seen students safely land Cubs in 40-mile gustly cross-winds because they had been taught what they needed to know to meet this situation. ★ ★ ★

THE DOCTOR SAYS NO

(Continued from page 27)

structor who had held a commercial license and flight instructor's rating for nearly a year with a perfect safety record, was refused renewal of his commercial and instructor's rating because one eye would not correct to the minimum with glasses. He asked for a flight test to prove his "aeronautical knowledge, ability and judgment" compensated for the weak eye but the Medical Division refused his request. When he filed a request with the Board for a hearing the flight test was authorized. The inspector recommended that the license be returned, but Dr. Stovall refused. When the pilot insisted that the Board go ahead with the hearing the license was returned.

The most ridiculous case, however, is a pilot in Oklahoma who stammers. At first he was refused a license because the Medical Handbook says any applicant is disqualified who has "any condition of the tongue producing interference with speech." Because the applicant refused to "give up" he finally received a third class medical certificate but it was restricted against "carrying passengers or flying an airplane equipped with two-way radio."

No doubt some of us have already guessed that the Medical Division considers dog-hair, horse-hair and ragweed pollens very hazardous in the air, especially at altitudes above "500 feet over open country" but few of us have realized the extreme hazard to which a passenger is exposed by a stammering pilot! Likewise we failed to realize the complications which arise when a pilot who stammers steps into an aircraft equipped with two-way radio! Silly, isn't it? That's what I think, too. ★ ★ ★

AIRLINE TO BATTLE

(Continued from page 29)

Lewis Chandler, Jr., Austin, Texas; Lt. (jg) Walter J. Blanchar, Port Neches, Texas; Lt. A. W. Talton, Van Buren, Arkansas; Lt. (jg) George D. Boyd, Groesbeck, Texas; Lt. (jg) William B. Burns, Shreveport.

A few navigators who hail from the South are: Lt. Ben C. Dawkins, Jr., Shreveport; Lt. John D. Coats, Merkel, Texas; Lt. Harold A. Prinz, Dallas; Lt. (jg) Lewis R. Fisher, Galveston.

From time to time our navigator takes a series of star shots and then quickly plots our position. Now and then he may call for a slight change in heading. He uses the latest radio aids as checks; and when, at long last, he says, "We'll be there in thirty minutes," you may take him at his word.

Kwajalein Strip Busy as Love Field

We descend from our flight altitude and see nothing but miles of ocean. Then, directly ahead, a white fringe of coral reef appears and just beyond Kwajalein atoll takes shape. These islands on our routes vary in size. Some are long, thin, curved atolls like Kwajalein; many are little wider than their air strips. Others have towering mountains and lush vegetation.

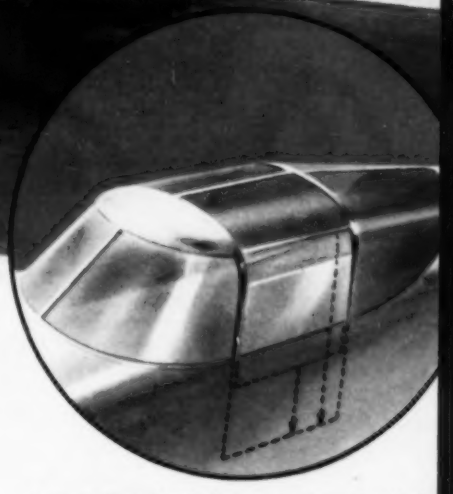
The tower clears us for a landing. As we start our base leg turn, down go the wheels, on the final, full landing flaps come down and the big plane descends smoothly to the coral strip. Just off the runway, the Skipper pulls slowly back on the yoke, holding her off. The wheels touch gently. The Skipper relaxes yoke pressure to let the nose wheel settle to the runway. It is amazing how gently these fellows can put 55,000 pounds of airplane on a runway.

A little over a year ago the Japs were running Kwajalein. Now only burned-out pill boxes and bullet-frayed palm trunks remind us the Japs were here. The strip is run efficiently and with all the hustle and bustle of the Kansas City or Dallas airports. Transports come and go. Grumman F4F's and Hellcats, engines warming, wait to be cleared for take-off. A patrol of Corsairs wheels across the sky.

The air transport officer takes charge of the passengers and cargo. The plane is gassed and another crew takes over. Even as we ride to our quarters, the plane is off on the next leg of her trip.

Tomorrow morning we'll be off again, speeding westward toward the Rising Sun, but flying across an area where it has long been set. Eventually the men of NATS expect to be delivering high priority cargoes to our fighting men in Japan proper. Looking back on the events of the last three years, that is not expecting too much—not from NATS. ★ ★ ★

Control Tower Vision gives new flying safety and pleasure in the *Swift*



Arrows indicate how both top and side panels slide do into fuselage wall. A lock on top where panels meet secu the entire cabin.

Wide, clear vision is ***one*** reason why you'll enjoy flying the new ***Swift***.
The ***Swift's*** dynamically styled canopy provides easy access to the roomy cabin from either side through sliding panels that disappear into the fuselage walls. You just step in and sit down . . . no stooping, crouching, or effort required . . . no door to catch the slipstream.

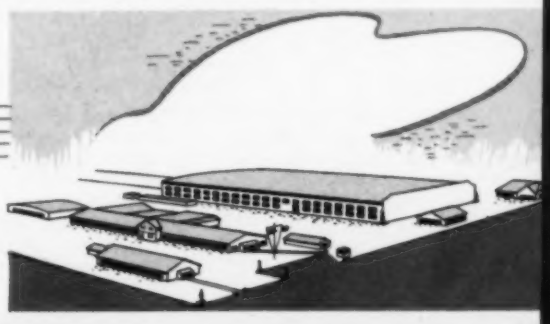
The double-track panels give you any degree of airiness you want . . . top with sides open . . . sides with top open . . . open either side . . . completely open or closed . . . from an open cockpit to a closed cabin as quick and easy as closing an auto window.

Top panels are tinted to provide sun protection.

Yes, the new ***Swift*** is the kind of plane you've dreamed of owning, and its reasonable cost and thrifty operation will make owning and flying your own plane surprisingly easy. The new ***Swift*** will be ready soon after conditions permit the manufacture of personal airplanes.

The Swift

Made by GLOBE AIRCRAFT CORPORATION Fort Worth, Texas



REVVING UP

(Continued from page 4)

left and let down to 2,000 feet immediately, with a landing light on. He came on down and found contact a quarter-mile away. All of which shows a lot of ingenuity by CAA Controllers Franklin R. Hardesty and Carroll W. White in the Fairfax tower.

★ ★ ★

KNOCK OUT BLOW: One of the most devastating air attacks in history was staged between February 22-26 throughout Hitler's crumbling Reich as a prelude to successful Allied drives during March. More than 8,000 sorties a day were flown with wide-ranged accomplishments including the following results: 1,300 major rail cuts, 1,000 locomotives, 10,000 rail cars and 3,000 motor transports knocked out.

★ ★ ★

IWO CLASSIC: "I've never seen so many fighters and fighter bombers at work in all my life," reports an observer just returned from the Iwo Jima invasion. "We threw in everything we had." Citing the attack as a classic in air support of ground and sea forces, our informant told of the effective job the low, slow flying recon and liaison ships accomplished in spotting Jap gun positions. With every foot of ground bitterly contested, Navy big guns of the fleet lying off Iwo's beach head were called into play, blasting enemy positions with pinpoint accuracy due to smoke bombs dropped by the spotters. In some instances enemy positions were less than 200 yards from the American Marines. Carrier-based Tokyo raiders were employed during the first four days of the invasion with lots of rockets and fire bombs in evidence. After this initial assistance, the carrier fighters returned to the job of helping the heavies over Honshu.

Airmen's Calendar

April 14-15—CAA Non-Scheduled Advisory Committee meeting at Des Moines, Iowa.

April 16—World Air Transport Operators meeting at Havana.

April 24—Aircraft Industry Advisory Committee of WPB, first meeting, Washington, D. C.

June 7-9—Aviation Writers Association annual convention, Chicago.

October 31-November 3—1945 National Aviation Clinic, Oklahoma City.

★ ★ ★

AIRMAN'S ALMANAC: About the best book bargain to come our way in a long time is the Airman's Almanac for 1945, edited by Francis Walton and published by Farrar & Rinehart. Price: one buck; available at your bookstore and from some newsstands. Replete with historical data and condensed factual material on practically every subject from Aeropolitics to "Zeke" performance figures, the 500-page volume is a veritable storehouse of aeronautical information. Not only should it prove valuable as a reference but it's also the kind of book you can take home at night and browse through, picking out the subjects that look interesting. For example, we got a kick out of checking through the list of American World War I aces and comparing them with World War II aces. We congratulate Editor Walton on an excellent job. He even included the Civil Aeronautics Act of 1938, a document under which we all operate but one that has been read by very few of the people it affects. Airman's Almanac is certainly a "must" for every airman's bookshelf.

★ ★ ★

SMOOTHING OUT THE BUMPS: On a recent stop-over in Pittsburgh we noticed a young lady at a desk in the airport terminal lobby. There wasn't any sign revealing the nature of her operations although she looked like some kind of receptionist. We later learned that Pennsylvania Central planted her there for "customer" relations, her duties including such delicate tasks as the diplomatic handling of passengers bumped by priorities, securing hotel accommodations, locating baby milk warmers and pacifying disgruntled passengers. It was refreshing to see PCA at work after having been kicked around ourselves since the war dropped burdens on the airlines to such an extent that they haven't been able to maintain their prewar reputation for super-service. We hope the idea is adopted universally, especially during the priority fiasco, when so many customers are getting mad at the airlines.

★ ★ ★

NAVY BEHIND AIR POWER LEAGUE: Following endorsement by Assistant Secretary of the Navy for Air Artemus L. Gates and Vice Admiral Aubrey W. Fitch, Deputy Chief of Naval Operations for Air, the Air Force League has changed its name to "Air Power League." It was organized with the active support of Gen. H. H. Arnold, commander of the Army Air Forces, and Charles E. Wilson, president of the General Electric Company, is president.

★ ★ ★

CAP VETERANS: The Association of Civil Air Patrol Veterans, Inc., has been chartered at Charlotte, N. C., to organize on a national basis CAP members who served on active duty with and for the armed forces in CAP Coastal Patrol, CAP Tow Target, CAP Liaison Patrol and CAP Army Courier Express. It is the sponsor of Rep. Joe W. Ervin's HR 2149 and Senator Claude Pepper's SB 381, which would entitle active duty members of the above units to the rights of a veteran and provide their widows and orphan children compensation and care. Annual conventions are planned. National headquarters are at 118 Court Arcade, Charlotte 2, N. C., and officers are Frank E. Dawson, Charlotte, commander; Ralph Earle, Philadelphia, first vice commander; Elbert C. Isom, New York, second vice commander; Jimmy Vacek, Galveston, third vice commander; R. E. Dawson, Jr., Charlotte, adjutant; Dan F. Ritchie, China Grove, N. C., treasurer; and George W. Grove, Hickory, N. C., chaplain and historian. ★ ★ ★

This informal view inside a Navy Skymaster on a long Pacific hop shows: (A) Plane commander steers course; (B) first pilot prepares cross-section of weather; (C) second pilot gingerly synchronizes the engines; (D) navigator works his charts; (E) radioman takes a message from point ahead; (G) flight orderly serves fruit juices; (H) second navigator catches forty winks (most flights only carry one navigator; this fellow is probably on a check ride). Note: Cartoonist Joe James, an NATS pilot who drew this while on a Pacific flight, omitted "F", without explanation.

MODERN AIRPORTS

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Smith Municipal
Airport, Fort Wayne, Indiana

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Progress Without Politics in North Carolina

Aviation leaders in North Carolina have managed to keep their feet on the ground, avoiding unnecessary state restrictions. Sound aviation development is the result.

By TOM DAVIS
Manager, Smith Reynolds Airport
Winston-Salem, N. C.

DID it occur to those few skeptical witnesses of the first flight of the Wright brothers that North Carolina would be a leading aviation state forty odd years later? Did this fact occur to you ten years ago, five years ago, or even yesterday? Well, it is truly a leading aviation state.

To be sure, there are a few, a very few, states having more registered aircraft, more licensed pilots, more landing fields, or more aircraft manufacturers, but in every case these states are comparatively thickly populated areas. For comparison, let's consider these Southeastern states: Virginia, North Carolina, South Carolina, Georgia, Florida, Tennessee, Alabama, and Mississippi. Each of these states has certain advantages over the others, such as population, location and the like; but, by and large, each has had an equal opportunity to excel in aviation. Why then, is North Carolina so far ahead of the others, aeronautically speaking?

Let's consider the status of North Carolina as far as airports are concerned. Not one of the states mentioned has as many airports as North Carolina. The figures as of January 15, 1945, are as follows: North Carolina, 45 airports; Florida, 39; Virginia, 33; Georgia, 28; Mississippi, 26; South Carolina, 23; Alabama, 21; and Tennessee, 21. These figures do not include military fields.

Certainly, the terrain of South Carolina, Georgia and other Southeastern states is more conducive to airport construction than North Carolina. Roughly one-third of North Carolina is mountainous, another third is rolling country, and the last third is comparatively level and ideal for airport location, except in swampy areas. This last third is quite similar to the terrain of the other Southeastern states, with the exception of Virginia. The argument that North Carolina may have more large cities is not apparently responsible for this large number of airports. Fifty per cent of the airports of North Carolina are near communities of less than 5,000 population.

Neither can it be said that North Carolina has been granted more Federal or State money for the construction of airports than other Southeastern states. Most of the other states have supposedly had the assistance of state aeronautics commissions with a full-time director of aeronautics to foster and encourage aviation, and in most cases have taxed the pilots of those states to derive funds for this purpose. North Carolina has had no such arrangement, but still it is way out in front, aeronautically. Apparently, it does not need this type of assistance.

TOM DAVIS

State Restriction Avoided

Farsighted Governor J. M. Broughton did see fit to establish an Aeronautics Commission in 1943, principally to determine the need, if any, for state aviation taxation, regulation, or a salaried Director of Aeronautics. The Commission, under the able and experienced leadership of Senator Roy Rowe, a private pilot himself, was composed of five outstanding business men, two of whom were also private pilots. They were paid no salary by the State and, in turn, there was no tax imposed on aviation in the State. These gentlemen held public hearings at eight different locations throughout the State. Pilots, city and county officials were especially invited to attend and participate in these hearings, at which everyone had an opportunity to speak his piece. Every phase of aviation was discussed at each session, and from these a tremendous amount of valuable information was gathered.

From this information the Commission has prepared and submitted its report to the Governor. They have also prepared a bill for submission to the State Legislature. This bill calls for a non-paid Commission, but no full-time Commissioner or Director of Aeronautics. It provides for no tax on aviation. The proposal, in brief, empowers the Commission to do EVERYTHING to promote aviation and NOTHING which could remotely retard its progress. It would not be empowered to regulate air navigation, pilots or aircraft. The Civil Aeronautics Administration of the United States Government does plenty of this. In fact, the Civil Aeronautics Administration has now realized, almost too late, that many of its regulations are unwarranted and tend to retard the progress of aviation.

Steps are now being taken, and studies being made to insure simplification of Federal aviation regulation. The CAA field force has done, is do-

ing and will continue to do a bang-up job of making flying as safe and practical as possible. After all, that's what we're after. Should each of the forty-eight states add its regulations on top of those already enforced by the CAA, airplane pilots would have to be walking Congressional Records, or risk being arrested in every state over which they fly on a cross-country flight. Another bothersome regulation of several states is that which requires every resident pilot to obtain a state pilot's license, in addition to his Federal license. He has to pay for his state license, but his Federal license is given to him without charge. This, added to pilot rating records, physical exam records, etc., makes a pilot's pocket bulge.

Fortunately, it can be said that North Carolina "looked before it leaped" into aeronautical legislation. Maybe that has something to do with its excellence in aeronautical activity.

A survey has shown that more private-type aircraft were sold in North Carolina than in any of the other seven Southeastern states. The question is why there were so many more private aircraft sold in North Carolina than in the other states having apparently an equal position. Another survey reveals that the average yearly income of prewar plane owners was as little as $2,250. The argument that North Carolina has a more prosperous population would not affect then, generally, the number of aircraft sold.

Aggressive Operators

Could it be that the Old North State has a bunch of super-salesmen? Not necessarily. Obviously, however, there have been and still are, a good number of aggressive commercial aviation enterprises, commonly known in aviation lingo as fixed-base airport operators, who have contributed as much to the high aviation position of North Carolina as possibly any factor. The sweat and blood of these "pioneers" has brought aviation out of the barnstorming period into a successful business enterprise. North Carolina is also fortunate in having a larger number of fixed-base operators carrying on successful commercial aviation operations every day than other Southeastern states. These operators have trained thousands of military pilots during the war period.

Another factor leading us to believe that North Carolina really has something, is the encouraging fact that numerous fixed-base operators from South Carolina and Georgia are steadily moving into North Carolina. In less than one year, commercial operators from South Carolina and Georgia have leased six airports in North Carolina to conduct commercial aviation business, and still others are trying to secure more. On the other hand, they have not established new operations to any extent in the other Southeastern states. Moreover, it is apparent that not one North Carolina fixed-base operator has any particular desire to open operations in any other state.

BLUE GRASS FIELD AIRPORT, Lexington, Kentucky, is to be put into operation soon. Shown above is the proposed Administration building to be built at the field. The airport is composed of 500 acres, with three concrete runways of 150 feet in width; two runways are 3,600 feet in length, and one is 4,000 feet long. There is room for later lengthening of runways as necessary. The field is to be operated jointly by the City of Lexington and County of Fayette. Peter G. Powell has been appointed manager.

Are not these facts the best obtainable to show that North Carolina is a leader in aviation? We should, in order to insure the continued top-notch position of North Carolina, welcome and encourage still more fixed-base operators to follow suit. Certainly, these operators moving into North Carolina should have had an equal chance to promote aviation in their home state. Selling airplanes and operating successfully has not been a cinch, and won't be for a long time. We hope that operators moving into North Carolina, however, do not think that by so doing the going will be easy, and that there is a lot of "gravy" to be gotten here. Because, actually, there is no "gravy." North Carolina operators have worked hard, and will continue to do everything possible to insure a steady and healthy growth of aviation. It is most encouraging to see this influx of business for our state, and we certainly want to steer clear of anything which might, on the other hand, stimulate a desire for North Carolina aviation companies to move into other states.

North Carolina is not lacking in scheduled airline service either, comparatively speaking. Three north-south routes and one east-west route are already certificated by the Civil Aeronautics Board. The Civil Aeronautics Board is the governing body for the granting of certificates to operate scheduled interstate air service. They should likewise govern intrastate scheduled service. Approximately forty applications are now in file, proposing additional service for North Carolina, but action on these cannot be expected for another year.

Protection for the Future

Well, what is the reason for this strange Shangri-La of aviation in the Southeast? Is it the result of the hard work of fixed-base operators? Is it the fact that pilots of North Carolina have not been hamstrung by state regulation, in addition to Federal? In our opinion, it is a combination of both. The pilots of North Carolina do not object to a non-political aeronautics commission, but they know there is no need for a full-time Commissioner of Aeronautics, to dream up more regulations and request taxation on aviation to pay his salary. The people of our state have already demonstrated their ability to excel in aviation by using their own initiative.

This enviable position is by no means an indication that the aviation people of the state should sit back and ride easy. More than that, it is a challenge for even more progression, which will come as a result of more hard work and more thoughtful planning. The bills introduced by Senator Rowe are the solution to the only problem of state aviation legislation. Many states have requested copies of these bills and express hearty approval. They, too, realize that state regulation and taxation is a hindrance to aviation leadership. We must also consider the thousands of North Carolina pilots now in the military services. They want to return to a state in which there will be unlimited opportunities in aviation.

North Carolina has a golden opportunity to continue its high aeronautical position. It is certainly on the right track; let's hope it stays there and that others follow its leadership.

★ ★ ★

Runway Construction for Very Heavy Airplanes

Many problems were overcome in building Lindbergh Field's 8,500-ft. runway to accommodate the heaviest airplanes now built or contemplated. Better than anticipated strengths were attained.

By JAMES C. FULLER

AT the municipally owned Lindbergh Field airport in San Diego, Calif., is one of the longest and best constructed runways in the nation.

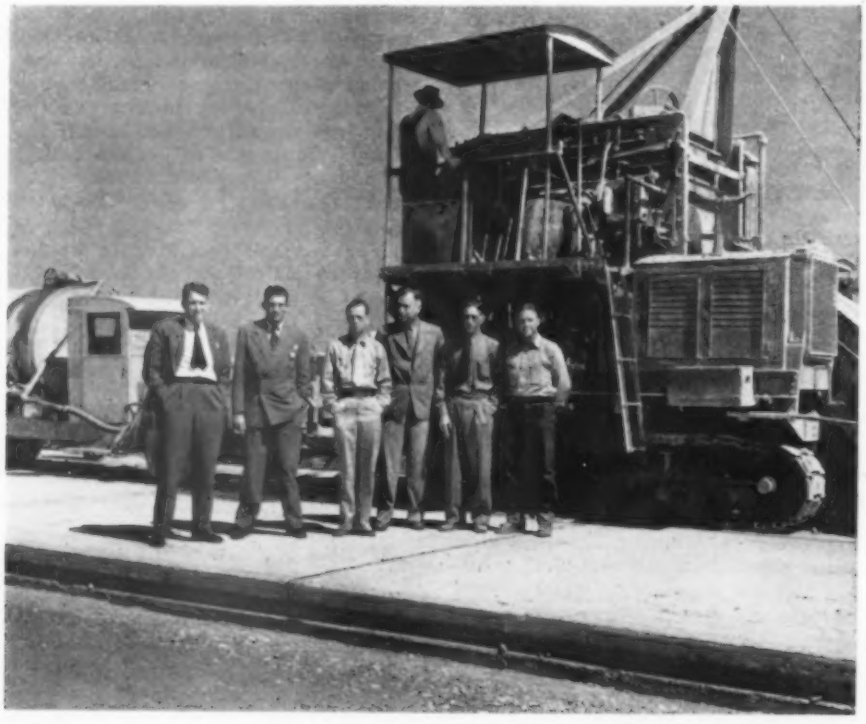
The new east-west runway is 8,500 feet long and was constructed at a cost of approximately $3,000,000 as a joint war emergency undertaking financed and directed by Consolidated Vultee Aircraft Corporation and the Navy Bureau of Aeronautics.

Designed to accommodate the heaviest type of aircraft now in the blueprint stage, the new runway is expected to serve San Diego's immediate need for a combined commercial, military and industrial air terminal. However, because of the enormous growth of air traffic in this area, officials of the San Diego Harbor Commission are planning an additional major airport and several auxiliary fields. Upon completion of these, it is probable that Lindbergh Field will be reserved almost exclusively for transport and cargo planes, and for the needs of the aircraft plants located adjacent to the field.

Inasmuch as the field lies entirely on land which was once the adjacent bay bottom, careful consideration had to be given to the design of the foundation. Engineers studied the problem and a thorough sub-surface investigation preceded the design. Tests were conducted to ascertain the nature and supporting value of the various materials. Other tests were made of nearby deposits of sand and gravel available for making the necessary fill and compacted sub-base upon which the finished paving rests.

As a result of the many tests, approximately 500,000 cubic yards of unsuitable plastic material was removed and replaced by selected materials of a demonstrated supporting value. Included in the replacement materials were pit-run gravel and sand used in the base of the fill, a selected sand base above the common fill, and crusher-run gravel, which lies immediately below and forms the sub-base upon which the pavement rests. All of these materials were required to meet rigid physical acceptance tests to assure that their supporting value will equal or exceed the design computations.

The foundation and pavement design was based on an 85,000-pound wheel load. Results achieved during construction, however, indicate that this may safely be increased to 175,000 pounds per wheel, which is ample to accommodate the heaviest types of planes now contemplated.



Here are the men who directed the job of constructing a new 8,500-ft. runway at San Diego's Lindbergh Field. Left to right, are Rhodes Rule, consulting engineer; J. F. L. Bate, Convair field engineer in charge of construction; Phil Helsey, Smith-Emery Testing Laboratories; J. G. Lynch, project manager; L. G. Krull, general superintendent, and R. L. Hapgood, concrete superintendent.
—(Consolidated Vultee Photo.)

Runways

The completed runway is 200 feet in width and 8,500 feet long. It is a portland cement slab of uniform twelve inch thickness, excepting the easterly end, where a fourteen-inch thickness provides for additional vibration loads in the warm-up area. Paralleling the runway are the taxi-lanes. They run the entire length of the runway and are seventy-five feet in width and of the same thickness as the runway.

The runway and taxi-lanes are separated by a surfaced strip 225 feet in width and which is divided into a series of flat catchment basins for temporary impounding of waters during extreme storms. This intermediate paved area is constructed of asphaltic concrete and similar paving is specified for shoulders along the pavement—fifty feet wide adjacent to the runway and twenty-five feet wide on each side of the taxi-lanes. The area is surfaced for a total width of 575 feet for the full length of the runway.

The maximum longitudinal grade on the runway is 0.1 per cent. This was determined by the extreme flatness of the original ground, not by flight requirements. To facilitate drainage, transverse grades were

made somewhat higher than has been the usual practice. The standard runway section has a 0.5 per cent cross fall from the center line of the pavement outward on either side for twenty-five feet and an increase of a 1 per cent grade from there to the edge of the concrete. This results in a maximum algebraic grade change across the pavement of 1 per cent, occurring at the center line. On the taxi-lanes it was not considered necessary to flatten the center crown and in this case there is a 1 per cent cross fall from the crown in either direction with a 2 per cent algebraic change at the center.

Shoulders and intermediate paved areas have a typical cross fall of 1.25 per cent which is reduced where required to create drainage divides.

The intersection of the existing and new runways required careful study of grades to provide as smooth a crossing as possible in either direction and yet permit drainage. In the development of these special grades a minimum grade of 0.5 per cent was adhered to wherever possible and a maximum grade change of 0.04 per cent in twenty-five feet along lines parallel to the center line. This plan is expected to assure smooth riding qualities.

Grading and Fill

Earthwork on the new runway was accomplished by dragline excavation and truck hauls to waste disposal areas and by carrying scrapers where the excavated material was suitable for reuse in the embankment. Imported borrow of selected embankment material was hauled in by trucks from two separate pits located approximately five miles away.

The outboard end of the runway strip extends into tidal flats where, to assure maximum settlement prior to paving, a system of wellpoints was installed and pumped until placement of that portion of the embankment had been completed.

Embankments were placed in nine-inch lifts, compacting to six inches. Field destiny determinations were made frequently to check compaction, which was specified to be 90 per cent of the AASHO standard, designation T99-38. Actual compaction frequently runs in excess of 110 per cent and in some cases averaged more than 10 per cent above specification requirements.

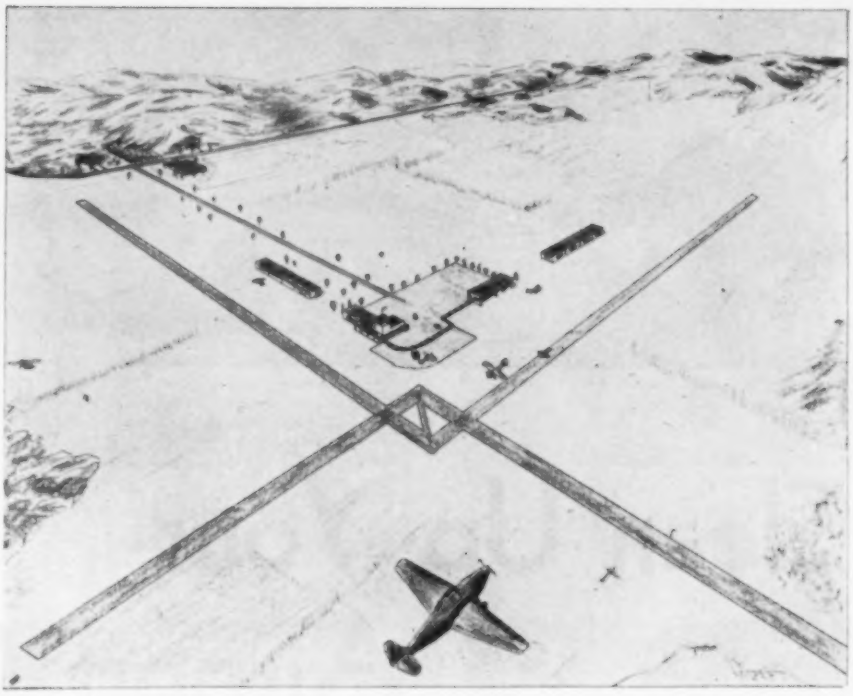
A field laboratory, under the direction of the construction engineer, was provided for quick determination of compaction and other physical tests required by the specifications.

A sub-base of select sand topped by crusher-run sand and gravel was designed to meet the assumed loads. The sub-base varies in thickness from six to twenty-four inches, depending upon the type and thickness of the paving, expected frequency of loading, and nature of the material beneath. Where the fill material already in place was clean sand, addition of the select sand course was omitted.

The sand course was required to equal or exceed a 25 per cent California Bearing Ratio value, soaked, and not to exceed 1 per cent swell at four days. Sand was required to be compacted to 90 per cent of the AASHO standard with actual field compaction to exceed the specification requirements by a safe margin.

From six to twelve inches of crusher-run material was placed on top of the select sand sub-base. This was laid down in two or three courses, depending upon the thickness. The material was required to have a two-and-one-half-inch maximum size, a 95 per cent compaction, a CBR of 80 per cent or more, soaked, and a swell not to exceed 1 per cent in four days.

In the case of the crusher-run material, considerable difficulty was met with the product of the selected pit. Although generally meeting the specification requirements, it was found that, apparently due to a very small colloidal clay fraction, it was difficult to work the material in the field. It was also discovered that the two-and-one-half-inch maximum size did not permit fine grading sufficiently close to make a suitable pavement sub-grade. To remedy this condition, the contractor closed the setting on the crusher jaws to reduce the maximum size, and also to produce a large percentage of crushed material. This not only improved the bearing values but also simplified the field procedure for making a close sub-grade. To avoid these difficulties the contractor at times had provided a sand cushion, averaging one-fourth inch thick, in preparing pavement sub-grade.



"Z" Landing Strip Design

Simplicity, economy and utility are claimed for this unique "Z" design for runways, prepared by M. W. Fanning, president of Airhaven Airports, Phoenix, Ariz., which plans to build and operate a network of Arizona airports. Planes land on one runway and take off on the other, with the separation eliminating delays for clearance and excessive taxiing. It also allows for central location of buildings and other facilities, providing greater use of land not needed for runways.

Paving

The job involved a total of 103,500 cubic yards of concrete paving. This was placed in twenty-five-foot strips between steel forms. Three 34E single drum pavers were used together, two on one side of the lane being paved with their skips in opposite direction to accommodate trucks. They were followed by a spreader with horizontal traveling blade and a vibrating screed, a full-depth internal vibrating machine and a dowel setting machine. Behind the dowel equipment, the contractor had a machine of his own design for cutting dummy joints, into which steel plates were inserted and left until the concrete attained sufficient set to stand when they were removed. The surface was obtained with a vibrating finishing machine followed by a final hand finish operation using wood floats and a burlap drag. The average concrete production was 1,560 cubic yards for a ten-hour shift, ranging from 689 to 2,258 cubic yards for the low and high days.

Due to the unsatisfactory local aggregate situation in the San Diego area, the greatest care was given to a study of existing sources of material and the specifications of processing and grading requirements.

The attention given to concrete design and job control was amply repaid in better than anticipated strengths.

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Matt Ryan at his desk and a view of the modern hangar and shop building at the Marshall, Minnesota, Municipal Airport, which he manages.

Clean Up Your Airport Operation

Expansion of landing field and runways will be needed by some fields, but most small airports need a good clean-up first. Utility and service can be improved without excessive spending.

By MATT J. RYAN
Airport Superintendent
Marshall, Minn.

IN the mad scramble of towns trying to secure a larger airport than their neighboring town the most important factors that will contribute to normal, solid growth and utility of the airport are overlooked. Large airports with expensive 5,000-foot runways are not the crying need at present.

One of aviation's pressing problems today is the need for improved service and pleasant surroundings for the air traveler. No matter how large or how small the town, if it maintains an airport it must place more emphasis on better accommodations for the itinerant flier.

First on the list is the need for clean rest rooms. If it is not possible to have water and sewer systems at the port, then the outdoor rest room should be kept spotlessly clean, well painted and swept out frequently.

Next on our list of airport necessities is the provision for reasonable transportation to and from the downtown area. This service can be provided in many ways, one by making a practical arrangement with a local taxicab operator and another is to have a car at the field as we do at the Marshall, Minnesota, Airport. We provide this facility at no cost to the air traveler. In towns where there are no restaurant facilities at the port, auto transportation to town becomes more necessary than ever. Remember the old saw that a pilot is more apt to starve to death than run out of gas.

At our field we make it a point to have someone out on the ramp to assist the approaching airplane to a parking place or to the hangar if it's an over-night visitor. If the pilot drops in for gas and oil, the windshield is washed and the ship turned around, ready for take-off. Our field personnel offers to crank the ship without waiting for a request. Little extra services like these don't cost the airport much and will pay big dividends in the long run.

Also high on the priority list, a necessity and convenience for the cross-country air traveler, is a good wind sock or wind tee properly located and in working order. If a tee is used it is best to have it so mounted that it automatically swings into the wind. Manually controlled wind tees are not practical on small fields where it is impossible to assign full time personnel to watch it. This type of wind tee has resulted in many landing accidents by giving false readings to approaching aircraft.

In our state we have heavy snow falls during the winter months. Too much importance cannot be given the proper marking of the landing areas when snow blankets the field. We have found that flags are the best method of designating the runways in order to keep the pilots out of trouble in the deep drifts. Likewise, heavy snows in our country prohibit the use of white crushed rock or other white material for the field circle marking and arrow in the ground. We believe it is far more satisfactory to paint the name of the town clearly on the hangar roof. If no building is large enough at the port, then some building in town will do. As private flying increases, every airport operator will have to attend to proper air-marking.

During the summer months constant patrolling of the landing area is necessary. A sharp look-out for rodent holes should be kept as well as for other obstructions which might cause the loss of a tail wheel, a broken landing gear strut or even a nose-over. Grass must be mowed regularly because tall grass not only is a hazard but has the unfortunate capacity of staining the exterior of the airplane when chewed up by the propeller and thrown back on the ship.

Airport managers as a rule like to receive suggestions for the betterment of airport service. However, they are constantly besieged by many groups and individuals with screw-ball ideas on how to run the airport. Many requests are so antiquated or fantastic that it's impossible to adapt them. It's the job of the management to sift the wheat from the chaff and apply as many suggestions for better service that can work on the airport involved. Usually, the little details that contribute to the customer's safety, convenience and comfort are not very expensive but are worth their weight in gold. People haven't changed much in the last 2,000 years — they still beat a path to the place where they are treated well.

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Towers that Talk!

American Airlines Photo

WASHINGTON NATIONAL AIRPORT

The nation's own, at the Capital City—Operated by CAA.

Delta Airlines Photo

NEW ORLEANS AIRPORT

Modern airport terminal at the Crescent City—an architectural gem.

American Airlines Photo

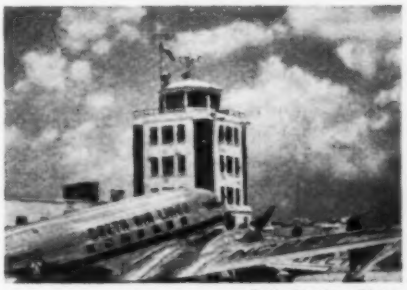
LOUISVILLE'S BOWMAN FIELD

Pride of the Blue Grass State.

Braniff Airways Photo

HOUSTON MUNICIPAL AIRPORT

Gateway to Mexico and Central America.



Delta Air Lines Photo

ATLANTA MUNICIPAL AIRPORT

Serving the metropolis of Southeastern U.S.

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Highways of the Air—a review of fact and opinion on the importance of radio in aviation—sent on request to those interested in airport design, construction and operation.

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Watch That Airport Lease

By JOHN H. FREDERICK

Airport agreements should benefit both operator and municipality. Here are some suggestions to meet all interests adequately, assuring satisfactory service to all concerned.

THE quickest way to start activity on a new airport or on one where there hasn't been much going on for a while is to lease to an operator. Many smaller towns have done this very thing. Others will be faced with making a decision on whether they want to run all activities at their airport themselves, through a manager on a salary, or whether they may not be better off by leasing to an operator.

In considering this important matter, the first thing that all should realize is that airport management and airport operation are not the same thing. Management as such should always be retained by the community either through a salaried manager or through an airport management committee reporting direct to the city council or city manager. Under this policy either the salaried manager or the management committee will represent the community interests in everything having to do with the use of the airport, all matters of maintenance and all matters of revenue.

The operator on the other hand, when a lessor, is in business for himself and as such is sometimes inclined to expect too much from tax-obtained public facilities. He thinks, among other things, that he should be protected against encroachments by itinerant, non-fixed, part-time barnstormers and that he should be treated quite liberally by the community if he invests money in shop equipment, aircraft and other operating essentials in order to make for successful utilization of the airport. On the other hand, communities usually feel that operators should ease the maintenance costs of an airport by sharing a justifiable part of the profit he makes as a result of the use of the airport facilities provided by the taxpayers.

Because of these divergent attitudes it is particularly important, both from the standpoint of the operator and the community leasing an airport, to examine very carefully all agreements and leases so as to be sure they mean just what everyone intended they should mean. On this page we are reproducing an exact copy of an agreement between an operator and a city and county, joint owners of an airport. This is reproduced exactly as it was sent to the writer for criticism except that the names of the community and the operator have been concealed. Let us look at this agreement and see some of its good and weak points.

The best thing about this agreement is that it only runs for one year. No community should ever grant exclusive use of its airport or enter into long-term leases at low rental, give away any franchises or control over buildings or use of the field, or permit subleasing without specific consent, for longer than a year. It is a mistake to do it at all but a tragedy when for any long period of time.

Other things wrong with this type of agreement are:

1. No minimum or maximum rates are set. To be sure, the High Flying Service agrees to charge others using the airport facilities "fair and reasonable charges," but this is too indefinite.

2. The city and county owning the airport sign away an important right by agreeing that they may not require the High Flying Service "to

AGREEMENT

THIS AGREEMENT, Made and entered into as of November 1, 1944, by and between Blank City, and Blank County Commissioners, parties of the First Part, and High Flying Service, a corporation, Party of the Second Part, WITNESSETH:

THAT FOR AND in consideration of the rental hereinafter stipulated and the covenants herein contained, the parties of the first part hereby agree to rent and furnish for the use of the party of the second part, for the term of one year beginning November 1, 1944, and ending December 1, 1945, the following described property:

All improvements, buildings and equipment belonging to the parties of the first part as now constructed and situated at the Blank Airport.

FOR WHICH, The party of the second part agrees to pay a monthly rental of $150.00 per month, payable monthly in advance;

THE PARTY of the second part agrees to furnish an airport manager and necessary watchmen at the airport; to pay all electric light and telephone bills incurred at the airport and to satisfy all CAA Regulations necessary to maintain the airport as a designated landing area;

THE PARTY of the second part also agrees that it will enter into such agreements with any other qualified person or persons desiring to use the airport for commercial purposes as may be approved by the parties of the first part, it being understood and agreed that fair and reasonable charges may be made by the party of the second part with the approval of the parties of the first part to other commercial users, such charges being for the purpose of partially defraying the cost of management and keeping the airport open for use and necessary to maintain the airport as a designated landing area;

DURING THE TERM of this agreement the party of the second part shall have full use of the airport improvements such as hangars, gas and oil pumps, shop facilities, office and miscellaneous buildings.

NOTHING IN THIS agreement shall prevent any established commercial air line from placing the Blank Airport on its itinerary and using the Blank Airport for its regular scheduled operation; and the parties hereto agree to make any necessary alterations or adjustments that they believe to be necessary to make possible such use of the airport whenever opportunity to do so is presented.

The parties of the first part declare that it will be their policy not to request second party to execute any contract with other users of the airport for gasoline sales, plane storage and shop privileges;

IT IS FURTHER AGREED that said contracts for the use of said airport facilities for commercial purpose may provide for the charging of standard and fair prices and rates for services rendered to the public; such prices and rates being subject to the approval of the parties of the first part;

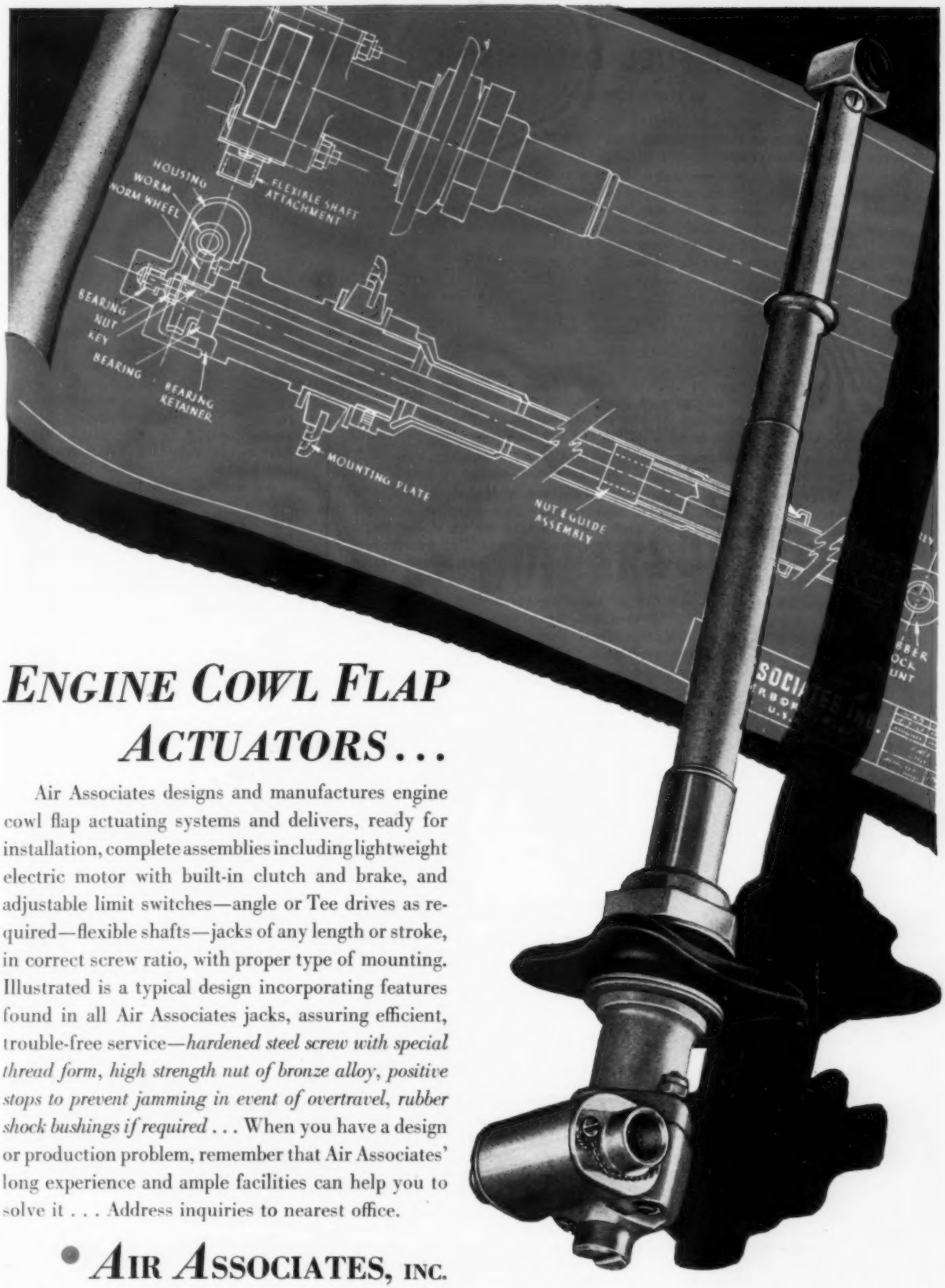
IT IS FURTHER AGREED that parties of the first part will maintain in a usable condition the runways and taxi strips and the physical improvements so that the airport can at all times be in commercial use.

IT IS FURTHER AGREED that this contract may be cancelled by the parties of the second part in case the government or other agencies restrict, curtail or eliminate private flying;

ALL COMMERCIAL Operators on the airport shall carry sufficient liability insurance to protect parties of the first part from liability growing out of their respective operations;

PARTY of second part agrees to secure and deposit with the parties of the first part an airport liability insurance policy in the amount of public liability $10,000 and $20,000 and property damage $5,000.

IN WITNESS WHEREOF, The parties hereto have hereunto set their hands and affixed their official signatures this 5th day of December, 1944.



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AIRPORT FUEL DISPENSING

By HART BOWMAN

WHEN it comes to dealing with the airlines, any mention of an airport retaining gasoline concessions and dispensing gas to the airlines proves the subject to be a "hot potato".

In this matter, airport managers themselves are not in accord. The general impression is that such gas sales, because of the volume involved, provide a source of revenue that can be the difference between an economical operation and heavy loss. Involved in the controversy is the entire matter of airport charges to airlines. However, letters that I have received from representative airport managers indicate some of the thinking.

Don W. Martin, manager of Detroit City Airport, is firm in his belief that municipalities should dispense or control the dispensing of all gasoline on their airports and at a profit to the municipality. At Detroit's new airport the plan will be for the city either to dispense the gas themselves from an underground installation, or to lease the concession to a combination of two or three aviation gasoline companies who will pay for the underground installation and who will prepay a good share of the percentage of the estimated future receipts. These companies will pay a few cents a gallon for the gasoline sales privilege.

Martin states that an underground system is an expensive first cost, but will pay for itself in its economic operation and saving in manpower.

From Hervey F. Law, manager of Washington National, comes a description of the system now in use there. The pipeline and pit method has been installed there, and a contract is let on a bid basis with a gasoline company, with the airport receiving a flat yearly fee. Gulf Oil was the successful bidder on a five-year contract, and installed the pipeline system.

In commenting on the possibility of handling the entire operation by the airport itself, Law warns of the difficulties entailed in the maintenance and operation of equipment and the personnel problem, but then admits that the greatest amount of money could be made under such a system.

W. T. Brown, Commissioner of Kansas City's Municipal Airports, has talked over plans with several oil companies. His conclusion is that a series of gas pipelines under the ramp, installed at the oil companies' expense, will be the most successful. Trucks, according to his thinking, have limited capacities. I believe he is right on this score, for the newer planes now being developed have capacities approaching that of a tank truck.

Brown is wary of the problems involved, especially those of liability, in servicing aircraft with the aid of municipal employes. As to the city receiving revenue from gasoline sales, Brown is opposed, believing that landing fees should be such as to include all necessary charge for the use of the airport.

On the other side of the fence is the comment of Pat Moore, secretary and treasurer of the American Association of Airport Executives. Moore says that everyone with whom he has discussed the subject agrees that any municipality which overlooks the value of controlling gasoline dispensation themselves is off the beam.

Moore also favors the pit method of gasoline distribution, but feels that trucks may continue to be needed for rush periods.

Still another side of the picture is presented by Buck Steers, Michigan's director of aeronautics, who expresses his opinion that inasmuch as airlines usually like to negotiate agreements with one oil company that will serve them at all stops, they will not like the idea of taking on different grades or kinds of gas at different locations. However, Buck still thinks that the cities should collect a cent or two per gallon on whatever gas they dispense even in their own equipment.

All of which goes to prove that the subject is really a "hot potato," for the airlines feel that they should be permitted to handle their own gassing facilities without paying "royalties" to the airports.

For my own part, I feel if the city furnishes the gassing facilities that reimbursement should be made to at least cover such costs. The most logical way to handle such reimbursement is on the basis of gallonage charges sufficient to offset such costs. As for the methods, certainly the pit method served by underground pipelines seems the most efficient, with the probability that a truck or two may be needed during the rush periods.

execute any contract with other users of the airport for gasoline sales, plane storage, and shop privileges." This means that the Flying Service has an absolute monopoly with everything sealed up tight in their favor during the duration of the lease.

3. Blank City and County must maintain "in a usable condition the runways and taxi strips and the physical improvements so that the airport can at all times be in commercial use." This despite the fact that the agreement divests them of all control.

It happens that other local people want to operate flying services and use Blank Airport. It is the only one in the county. But these others are unable to do so because the High Flying Service charges rentals considered to be excessive. In fact, they want any competitor to pay all the rent—$150.00 per month—and considerable in addition! So what is the result? The Blank Airport is operated solely by the High Flying Service entirely for its private use and benefit.

An airport is a public utility and should be managed as such by a municipality. An airport is supposed to render real public service for the equal good and maximum service to all concerned, including the general public. It is a mistake for any city or county to lease an airport to private individuals giving them total control with little or no responsibility for upkeep, but nevertheless placing such lessees in a position to shut out other possible users.

A carefully considered agreement can be drawn up to protect an operator without granting him exclusive rights to municipal or county airport property.

Agreements or leases should be drawn so that the operator knows exactly what his privileges and responsibilities are. The municipality or county should stipulate the types of operation permitted and require new agreements covering any changes. For example, an agreement may first cover only flight instruction but when commercial or common carrier air transportation is added it becomes the basis for a new agreement. Generally, everything producing revenue for an operator should produce something for the airport owners—the taxpayers—either on the basis of a fixed rental or percentage of income. ★ ★ ★

CAA Engineer to Direct Costa Rica Job

Carl Posey, Civil Aeronautics Administration district airport engineer at St. Paul, is to go to Costa Rica for about two months to advise the Costa Rican government on improving the airport at San Jose. Charles F. Dycer, chief of CAA Aircraft Engineering division, and Paul Spiess of the CAA Aircraft Engineering division have left for London to confer with British technicians on airworthiness requirements of aircraft used in international civil operations.

In the Air: From cockpit to tail cone, from bombardier's compartment to belly turret, the heating system that carries warmth throughout our Flying Fortresses in the sub-zero temperatures of the stratosphere is Guiberson built. The same engineering and production skill that produces Guiberson heating units for home and industry are now producing the aircraft heating system for the Flying Fortress.

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★ AIRPORT MERCHANDISING ★

By DUDLEY M. STEELE
Manager, Lockheed Air Terminal

THIS month we are going to talk about a service to the public which has long been needed and equally long neglected by many airports. The service is that of garage, service station, and parking.

More than ten years ago the idea of putting a garage on Lockheed Air Terminal was first conceived. Originally it was a three-party deal. The Terminal leased the land to an oil company, which erected the garage and, in turn, leased it to an individual who operated it. The Terminal received $25 per month rent, or $300 per year, for the land on which the garage stood. The oil company expected to profit by the sale of its products and the operator, of course, expected to profit from the sale of gasoline, oil, lubrication service, and garage storage of airline passengers' cars as well as cars of individuals who worked on the Terminal.

This sort of a deal turned out fairly well for the operator of the garage. The Terminal, however, profited very little ($300.00 per year maximum). In addition, the operator conducted the garage in a typical manner, and by that is meant it was filthy-dirty; the attendants were lax and wore soiled clothing; little or no attempt was made to do anything other than accept a person's order for gasoline and oil or to park his car for an indefinite stay. This type of operation was reflected in the fact that the sales of automotive gasoline averaged only 4,400 gallons per month for the eighteen months prior to the time when the present management took over its operation. It was a fairly profitable venture for the individual who operated it, but not to any great extent.

Know-How Proves Valuable

When this writer took over the management of the Terminal, he recognized the possibilities of much greater profit if the operation of this garage were in his hands. In this connection, however, it should be noted that he had had many years prior experience in the oil business and thus was familiar with the problems involved. Leases and agreements were revised and the Terminal took over the operation of the garage beginning in April, 1938. The garage was repainted in the colors of the oil company whose products were handled. The attendants were immediately put into white uniforms with white shirts and black bow ties. Windows were cleaned, floors were swept, and certain minor alterations were made which permitted doubling the number of cars which could be handled at the pumps. The gallonage jumped in the first month of operation to 9,900 gallons, and the profits at the end of the year were 1000 per cent more to the Terminal than under the former method of operation.

Since that time the original garage has been picked up bodily and moved to a new location fronting on a main highway. A new garage, double the size of the old one, has been built. Both garages are operating profitably. Subsequently a service station was built at the entrance of the Terminal, which fronts on a busy, main highway. This, too, has been a profitable venture. With the coming of gasoline rationing and the subsequent drop in sales, we looked for other business. We now offer the following services to the public: (a) Wheel alignments and wheel balancing, (b) Motor tune-ups, (c) Brake adjustments and brake relining, (d) Fender and body repair, and (e) Painting.

All of the above were in addition to the sale of gasoline and oil, tires, tubes, and accessories, lubrication service, and washing and polishing.

The first year of operation (1938) of the garage showed a gross business of approximately $23,000. For the year 1944, the business in this department grossed in excess of $300,000, and we sold 830,000 gallons of automotive gasoline and 18,000 gallons of automotive oil.

Both garages are full with a waiting list, thus proving our contention that the public, as well as employes on the Terminal, appreciate having a place in which to park their cars out of the sun and weather. The tremendous increase in the business, since we took it over and began to **merchandise** it, is also proof of the soundness of the operation and the desirability of **Terminal management** rather than an outside concessionnaire.

Parking Lots

This writer, before he became Terminal manager, had flown into and out of many airports in the United States and Mexico. He had never known of any charge being made for parking at airports. However, the old law of supply and demand, plus the necessity for some semblance of order in parking and the handling of automotive traffic, forced a decision. Dire consequences were threatened by various individuals if we ever made a charge for parking. We did so, however, and today, it is believed, no one would return to the old hit-or-miss manner of parking and handling of traffic.

The operation of parking lots is very profitable. They should be paved; proper shelters should be erected for the attendants; and a fool-proof system of checking in and out devised. One of our main parking lots is located immediately adjacent to the administration building. Into this parking lot go the cars of airline passengers, who are being driven out to the Terminal by some member of their family and who park their cars while bidding their family good-bye. The same is true for those who come to meet arriving airline passengers. Drivers are given a parking ticket which can be validated by the airline used by them; no charge is made for parking for a period of three hours. Patrons who come to the Terminal to have meals in our Coffee Shop or Sky Room or a drink in our Cocktail Lounges likewise may use this parking lot and have their parking tickets validated by our cashiers and no charge is made for three hours. Approximately 156,000 such validations were accepted in this one lot during the year 1944. Despite this number of validations, that particular lot made a substantial net return to the Terminal. The gross business done in this and several other parking lots at Lockheed Air Terminal during the year 1944 aggregated nearly $87,000.

Employes of Lockheed Air Terminal pay no parking fee, but employes of various tenants on the Terminal pay a monthly parking charge, which is nominal. Again, there is a long waiting list, both in our garage and in our parking lots, of persons who wish to have the convenience of these facilities.

The main parking lot adjacent to our Administration Building holds only ninety-six cars. In a normal day it will handle as many as 800 to 1,000 cars, indicating a turn-over of eight to ten times. It does not take very much mental arithmetic to figure how remunerative this type of operation is. Again, we could have leased this concession to an outside concern without any trouble. The return would have been fairly good, but the services might have been unsatisfactory and discourtesies might have been shown to our customers. We preferred to lay out these parking lots, install our own system, man them with our own personnel, and operate them ourselves. The returns have fully justified our thinking. The public has accepted it and is grateful for the convenience it offers.

That's all for now. See you next month. ★ ★ ★

TWA Sells Alhambra Field to Harlow Aircraft Co.

Alhambra, California, Airport and all of its facilities have been sold to Harlow Aircraft Company by Transcontinental Western Air, Inc. The amount of the sale was $350,000. The airport is to become a controlled landing area for private planes, with student flying being prohibited.

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A number of these Associate Bases have been established in the Carolinas and Georgia. There are still several localities open for alert airmen who wish to get into business in this territory.

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Porcelain-Enameled Steel Segments for Fade-Proof Marking

To provide permanent air markers which will not fade in weather, the Carnegie-Illinois Steel Corporation's market development division has designed a series of porcelain-enameled steel segmented sections which can be assembled into letters, figures or symbols as desired. The height of letters, sizes, colors, shapes and widths of strokes all conform to CAA suggested standards, and can be made by any porcelain enamel plant. They can be shipped in compact boxes, each with full instructions and necessary screws and washers for assembly.

Wiggin Back at Post

Lt. Commander F. Webster Wiggin, recently released from active duty after having been associated with naval flight training for over three years, has returned to the job he had before entering the Navy, manager of Embry-Riddle School of Aviation's seaplane base in Miami, Fla. During his Navy service he supervised the flight training of more than 3,000 cadets and officers in naval primary and instructor schools and in the Ferry Command.

Tennesseans Propose Co-operative Airports

A co-operative airpark is planned for Nashville, Tenn., by a group headed by Norman Thomas, Chattanooga operator, who explained the term "co-operative" as meaning that "reliable, experienced aviation firms will lease and operate facilities over a long period." An announcement said: "Modern merchandising methods will be used. The field will be open to qualified operators, certified repair agencies, supply stores, gas and oil companies, recreational facilities, restaurants and other businesses necessary to a successful operation." Thomas owns and operates the Thomas Airpark in Chattanooga, and is president of Southern Aviation Corp., and said he was interested in the project through efforts of the Tennessee Bureau of Aeronautics. "We believe privately-operated airparks of modest dimensions can and will be sound business," he said.

NEW CONTROL TOWER at Berry Field, Nashville's municipal airport, is structurally complete and work is now in progress on the installation of control equipment, Civil Aeronautics Administration officials announced. Perched atop the high bay area of the Nashville plant of Consolidated Vultee Aircraft Corporation, the tower rises approximately 100 feet above the highest point on the airport. Its construction was necessitated when the airport grew to such proportions that the entire field could not be observed from the original tower. The city, which built the tower through the cooperation of the CAA, signed a 10-year lease with Convair for the use of the factory as a base.

8,200-ft. Runway at Fort Worth for Newest and Largest Airplanes

Work will start soon on the construction of an 8,200-ft. concrete runway at the Fort Worth Army Air Field, for joint use of the Army and Consolidated Vultee Aircraft Corporation's factory there. The runway will be designed to accommodate the heaviest airplanes now under construction or contemplated, and will be supplemented by an equally heavy taxiway connecting it with the factory. It is expected to cost more than $2,500,000.

Los Angeles to Vote On Airport Bonds

After much preliminary action, the Los Angeles city council has ordered an election at which $12,500,000 in bonds for expansion of the Los Angeles Municipal Airport will be voted upon. The proposition will be submitted to the voters on May 1.

McKellar Airport Leased

Gillespie Airways of Nashville has leased the $1,500,000 Kenneth D. McKeller airport four miles west of Jackson, Tenn., owned jointly by the city and county. The airport covers 500 acres and has two 3,500-ft. concrete runways, a sodded runway and several hangars and buildings. Gillespie Airways has applied for feeder operations in the Tennessee area.

Dick Henson Heads Maryland Operators

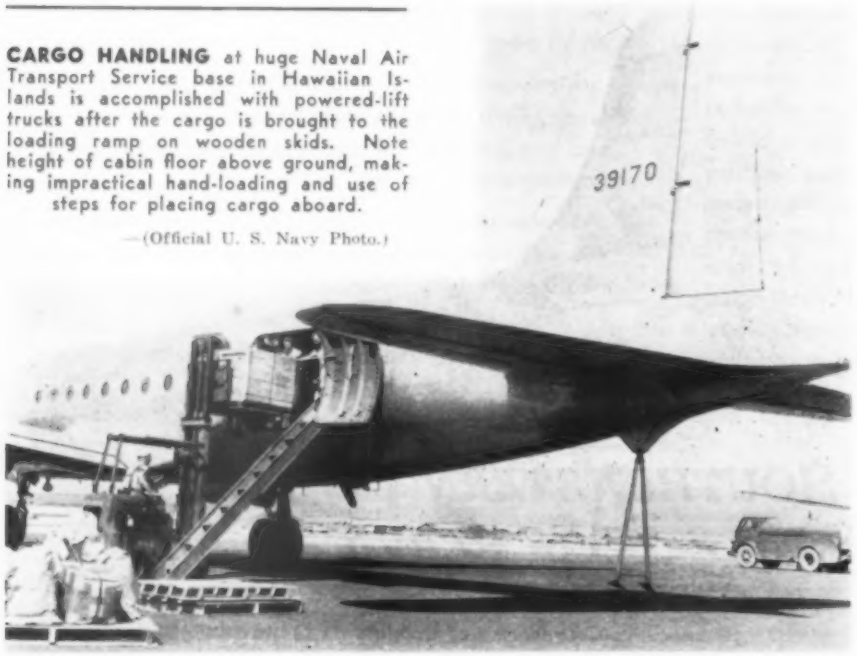
The Maryland Airport Operators Association has been organized with Dick Henson, Hagerstown operator, as president; Walter Mainville, general manager of Baltimore's Curtiss-Wright Airport, vice president; and Miss Thelma Chell, Woodlawn, secretary-treasurer. The Association, in which Arthur Hyde, well-known operator, has been especially active, will work for favorable legislation and seek constructive activities on the part of the state's aeronautics commission.

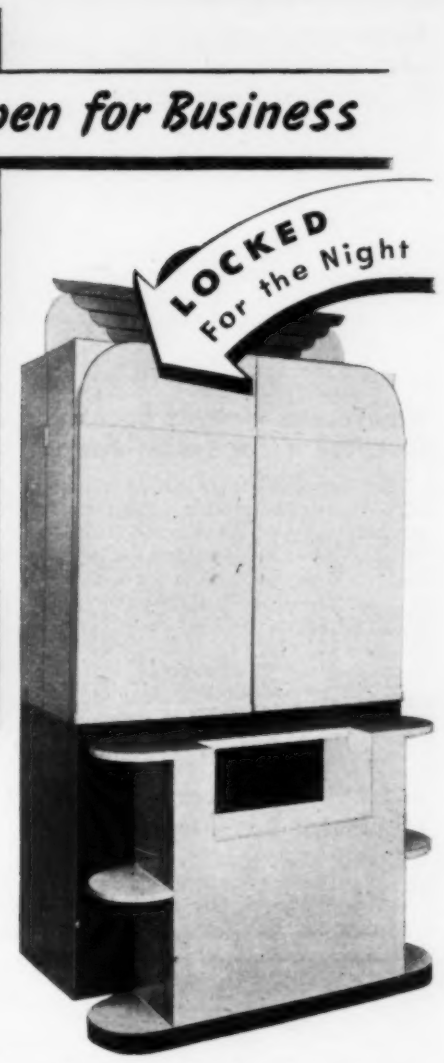
Boston Needs 60 Fields

Speaking in Boston recently, William A. M. Burden, Assistant Secretary of Commerce for Air, said that city will need sixty airports by 1955. He based his estimate on the assumption that 6,000 private planes will be owned and operated there within ten years.

CARGO HANDLING at huge Naval Air Transport Service base in Hawaiian Islands is accomplished with powered-lift trucks after the cargo is brought to the loading ramp on wooden skids. Note height of cabin floor above ground, making impractical hand-loading and use of steps for placing cargo aboard.

—(Official U. S. Navy Photo.)





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Airport Management and Operations Studied by Harvard Researchers

An exhaustive study of airports and their operations is being conducted by the Harvard Business School. It will be the first comprehensive analysis of airport management and operations embracing such items as economic aspects, administrative methods, expenses, revenues, budgets, management training and Federal, state, municipal and private ownership.

Hawthorne Named Beech Distributor for Large Area

Hawthorne Flying Service has been appointed regional representatives for postwar sales of Beechcraft airplanes, according to Carl Wootten, Beech Aircraft Corp. sales manager. Hawthorne's area is to comprise North and South Carolina, part of eastern Georgia, the District of Columbia and several counties in Maryland and Virginia. Hawthorne is to appoint distributors and dealers in these areas.

$41,000,000 Airports Fund Urged for Los Angeles

Unless California gets more intelligent action in planning and acquiring sites for airports, it may be that the State will no longer remain the "10 per cent state in aviation", T. C. Coleman, vice president of Northrop Aircraft, Inc., pointed out recently. Coleman believes that Los Angeles needs $41,000,000 for new airports and expansion of old ones. He also suggested creation of a Los Angeles County Airport Authority with power to acquire sites before land speculation becomes too prevalent.

Allin Joins Airways Engineering Consultants, Inc.

Col. B. C. Allin, director of the Greater Miami Port Authority for the past six months, has resigned to enter the airport planning field. He is joining the firm of Airways Engineering Consultants, Inc., in Washington, D. C., to become vice president in charge of the Pacific Coast area, and will make his headquarters in Berkeley, California. While at Miami, Col. Allin was in charge of all planning, construction and operations of air and water facilities for the area.

Airport Construction

Construction awards by the Chief of Army Engineers announced last month included:

SAN ANTONIO, TEX.—M. B. Killian & Co., and E. B. Darby & Co., San Antonio, for additional airfield construction at Randolph Field at an estimated cost of $2,029,221.74.

SAVANNAH, GA.—Wright Contracting Co., Columbus, Ga., for construction of hangars at Chatham Army Airfield. The cost is estimated to be $324,129.85.

TUCSON, ARIZ.—A. C. LaRue, Tucson, for construction of hangar at Davis-Monthan Field at a cost of $148,907.62.

ROSWELL, N. M.—Hayner & Burn, Las Cruces, N. M., for construction of double hangar, relocation of buildings and paving at Roswell AAF. The cost is estimated at $367,714 62.

SEATTLE,WASH.—Northwest Construction Co., Seattle, for grading and drainage for reconstruction of taxiway at Boeing Field. The cost is approximately $51,899.76.

LOS ANGELES, CALIF.—Tanner Construction Co., Phoenix, Ariz., for construction of taxiways and additional paving at Victorville AAF. The cost is $133,533.25.

SALINA, KANS.—Martin K. Eby Construction Co., Wichita, for construction of hangar, including utilities, storage, etc., at Smoky Hill AAF at a cost of $210,125.35.

KENNER, LA.—T. L. James & Co., Inc., Ruston, for construction of extension of runway at Moisant Airport, at a cost of $283,885.50.

BUT visibility may be "zero" on bright days due to sun-glare. Everywhere, practical airport managers use tinted, transparent acetate shades to reduce this glare and increase operator efficiency. These shades are durable, non-inflammable and convenient. Write or wire for sample swatch prices and more complete information today.

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Recognition and Encouragement of Privately Owned Fields Urged

Views of the United States Chamber of Commerce on the Federal-aid airport system provided in Senate Bills 2 and 34 have been presented to the Senate Commerce Subcommittee on Aviation, as follows:

1. Replacing construction mainly by the federal government, federal-aid airport system should be established.
2. Federal funds for airports should be matched by at least equal amounts of state or local funds.
3. Federal funds should be restricted to grading, drainage, construction of runways, lighting and safety features.
4. Federal funds should be apportioned by an equitable formula taking account of the needs of the various states and localities from the viewpoint of a nationwide airport system, with due consideration to the provision already made of airports from defense and war expenditures.
5. State or local jurisdictions should be required to provide land, buildings and maintenance.
6. A major part of such a program should be reserved for periods of low business activity.
7. Administrative and financial responsibility for airport work should be concentrated in a single agency in each jurisdiction—federal, state and local.
8. There should be airport planning surveys in each state in co-operation with the federal agency on the one hand and local airport authorities on the other.
9. Plans for airport systems should recognize that privately owned and operated airports constitute approximately one-half of the total number of existing airports, although a much smaller fraction of the total expenditures thereon, and that these private airports represent investments of great importance to future development.
10. Governmentally financed airport projects which would result in destructive competition with existing private airports serving the same areas and types of aviation service should not be undertaken.
11. Publicly owned airports should as soon as practicable be put on a self-sustaining basis.

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Official Figures Place Cost of U. S. Civil Airports at $1,027,159,416

Civil Aeronautics Administration figures submitted to the Senate Commerce Committee's aviation subcommittee show that $1,027,159,416 has been expended for U. S. civil airport construction prior to 1945.

Military and naval airport construction during the period 1940-44 totalled $1,112,841,880, with the Army's share being $1,036,853,880—more than the combined cost of all U. S. civil airports.

A CAA breakdown of the civil airport expenditures showed $740,705,171 of Federal funds, $192,950,000 of municipal funds, $83,348,980 of commercial and private funds and $10,155,265 of state funds expended.

The number of airports listed under Federal construction programs as of the end of 1944 was 1,066, with 1,928 being improved, at a total cost of $679,025,777 in CWA, FERA, FWA, WPA and CAA money.

The Army was shown to own 315 airports and to occupy 301 others for a total of 616, and the Navy's total was placed at 370, of which 276 are owned and ninety-four occupied.

Here are some of the figures prepared by the CAA:

ESTIMATED ANNUAL CAPITAL EXPENDITURE FOR CIVIL AIRPORTS BY SOURCE OF FUNDS

Year	Federal Funds	State Funds	Municipal Funds	Commercial & Private Funds	Total Expenditures
Prior to 1933	$ 1,094,328	$ 2,905,869	$ 69,664,517	$72,646,799	$ 146,311,513
1933	18,290,000	550,000	5,530,000	665,000	25,035,000
1934	18,290,000	550,000	5,530,000	665,000	25,035,000
1935	18,290,000	550,000	5,530,000	665,000	25,035,000
1936	18,290,000	550,000	5,530,000	665,000	25,035,000
1937	18,295,786	552,491	5,537,780	665,592	25,051,649
1938	46,476,164	890,697	4,136,935	3,236,153	54,739,949
1939	28,435,000	250,000	16,930,000	820,000	46,435,000
1940	28,440,508	250,000	16,934,261	820,436	46,445,205
1941	136,200,000	776,000	14,406,000	700,000	152,082,000
1942	136,200,000	776,000	14,406,000	650,000	152,032,000
1943	136,200,000	776,000	14,406,000	600,000	151,982,000
1944	136,203,385*	778,208*	14,408,507*	550,000*	151,940,100*
Total	$740,705,171	$10,155,265	$192,950,000	$83,348,980	$1,027,159,416

*Estimated.

FEDERAL AIRPORT CONSTRUCTION PROGRAMS TO END OF 1944

	New	Improved	Total	Expenditures
Civil Works Administration	566	386	952	$ 11,503,267
Federal Emergency Relief Administration	55	888	943	16,239,554
Public Works Administration		35	35	14,773,080
Works Projects Administration	197	367	564	331,089,971*
Civil Aeronautics Administration	248	287	535	320,192,985†
	1,066	1,928	2,994	$679,025,777

*Number of locations to June 30, 1940.
†To December 31, 1944.

New Senate Bill for Airports to Reflect Testimony at Hearings

Support for Federal-aid airport legislation was expressed at hearings before the Senate Commerce Committee's aviation subcommittee in March, and sentiment appeared to favor a division between state and urban programs with the CAA dealing directly with cities on large projects and through the states for others.

Senator Pat McCarran of Nevada was named chairman of a group composed of Senators Warren G. Magnuson of Washington, Harold H. Burton of Ohio and C. Wayland Brooks of Illinois to prepare a new bill embodying features of both the McCarran bill and one introduced by Senator Josiah W. Bailey of North Carolina.

An array of leading airport and aviation authorities appeared before the subcommittee, and CAA Administrator T. P. Wright expressed favor of the division whereby cities would be dealt with on Class 4 or larger airports while states would be dealt with on smaller projects. Secretary of Commerce Henry A. Wallace stressed the need of a Federal-aid program, calling for immediate planning and appropriations for construction.

Aviation taxation was proposed by Senator Bailey as a means of financing airport construction and to avoid continued Federal deficits. But Secretary Wallace and others emphasized the danger of restricting aviation development by taxation. Opposition to Federal financing was voiced by Mayor E. J. Jeffries of Detroit, who said he believed cities are unable to subsidize aviation.

Many witnesses appealed for adequate construction of airports for private fliers and airparks, spokesmen pointing out the importance of increasing the private plane's utility by affording more landing places.

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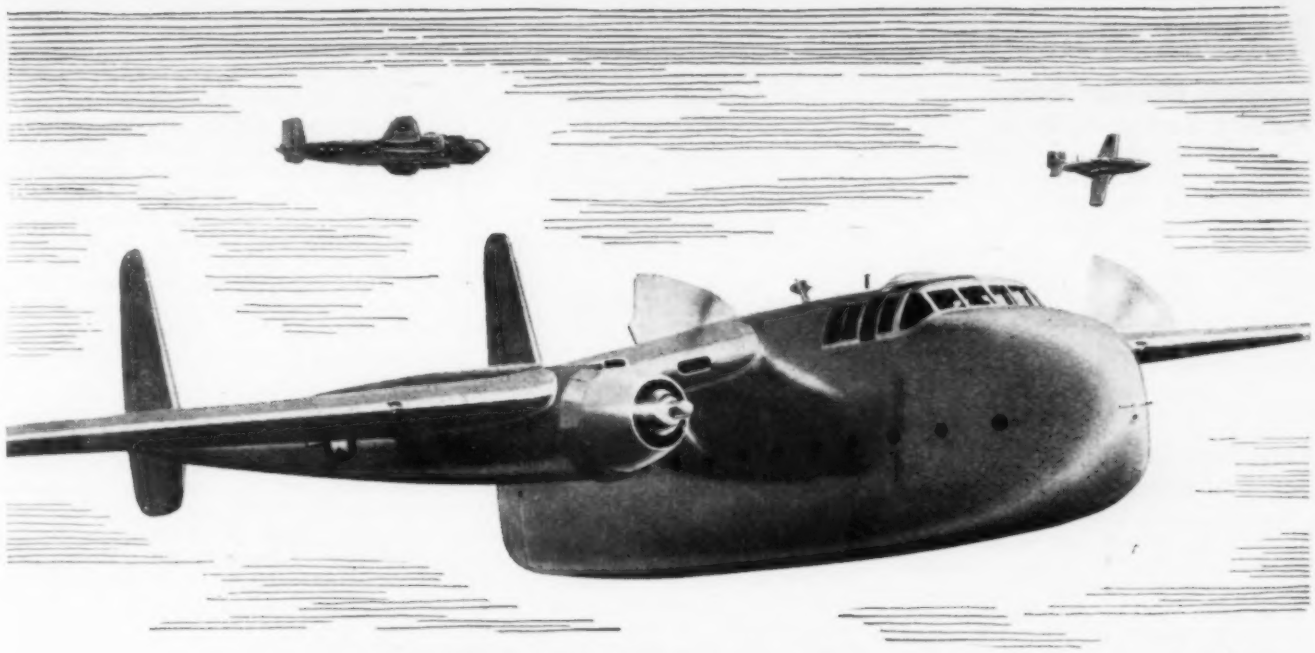

NORTH AMERICAN JOINS FAIRCHILD IN PRODUCING THE

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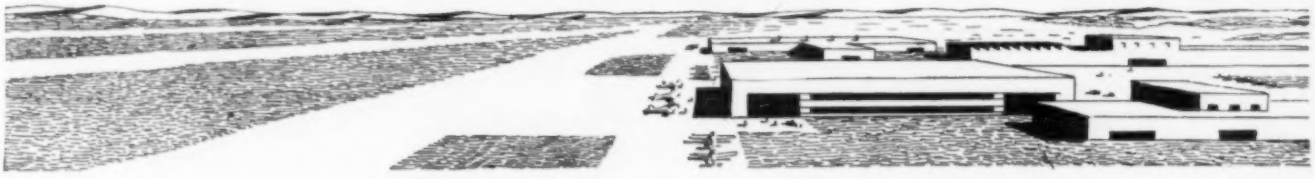


AMERICAN air power, the mightiest on earth, was built by teamwork with American industry. Into our ships of the air go the efforts of manufacturers and suppliers great and small.

The Fairchild "Packet," the Army's newest and most efficient carrier of air cargo, was built by this kind of teamwork: The teamwork of the Army with Fairchild designers and engineers, Fairchild sub-contractors, builders of engines, suppliers of metals, the sub-assemblers and fabricators of myriad parts and materials!

Now the Army Air Forces have designated North American Aviation, Inc., as another builder of "the flying boxcar." Fairchild welcomes this newest member of the "Packet"-building team, famed for the B-25 Mitchell Bomber; the superlative fighter, the P-51 Mustang; and the AT-6 Texan.

Soon the "Packet" will be coming down the runways from both Fairchild and North American.

Fairchild engineering and design built these features into the "Packet":

- The ability to carry a nine-ton load in cargo or men and equipment.
- A range in excess of 3,500 miles.
- A cargo capacity of 2,312 cubic feet—about 88% of a standard boxcar's capacity.
- Space for 42 paratroopers and their equipment; rear end jump doors that deliver them "in the clear."
- Special doors in the belly, through which a paratrooper's equipment is parachuted simultaneously with his jump.
- Quick conversion to an ambulance plane capable of evacuating 34 stretcher cases with four attendants.
- Lowspeed landings and quick take-offs from ordinary airstrips.
- Fine flying characteristics, typical of all Fairchild aircraft.
- The only modern airplane being produced to *specifically* carry cargo.

BUY U. S. WAR BONDS AND STAMPS

Fairchild Aircraft

Division of Fairchild Engine & Airplane Corporation, Hagerstown, Maryland

AIRPORT EQUIPMENT

Koppers Booklet Gives Tarmac Surfacing Data

A brochure, "Surfacing with Tarmac," has been issued by Koppers Company, Inc., Tar and Chemical division, describing fourteen types of paving treatment. Advantages of each type of treatment are described along with the methods of applications. Tables showing Tarmac and standard road tar designations, applications, temperatures and uses are included. Road repairs are given considerable space in the booklet.

One-Pass Stablizer for Soil Preparation

Harnischfeger Corporation of Milwaukee has announced a new soil stablizer which will make possible faster, more economical construction of airport runways, parking lots, etc. Known as the P. & H. Single Pass Stabilizer, the machine permits on-the-spot processing of native soils, combining in one operation all the necessary functions in soil preparation. Information is available on request.

EQUIPMENT SERVICE

Readers desiring full details concerning Airport Equipment and Airport Literature are invited to address postcard requests to
MODERN AIRPORTS
P. O. Box 750, Dallas 1, Texas

Airplane Chek-Charts Distributed by Esso

A complete series of lubrication guides, prepared by aviation experts in conjunction with lubrication engineers of the Chek-Chart Corporation, is being distributed to Esso aviation dealers. Complete lubrication needs of all types of airplanes can be handled by Esso airport dealers with the aid of these charts, consisting of thirty-nine full color diagrams, covering twenty-five makes of planes and fifty-seven different models of planes. Every lubrication point in the plane to be covered is indicated in each chart, and a simple index system gives authoritatively the lubricant to be used and how often.

Booster for Paging, Inter-Office Communications

The Talk-A-Phone Electronic Laboratories has developed a new and improved HP-16 Booster which enables inter-office communication and airport paging facilities to be possible in the same system. The HP-16 is capable of delivering a minimum of fifteen watts "voice range" power, which is more than sufficient to cover the average paging system requirements. However, more than one booster can be used in a system where greater power levels are necessary. The unit is compact, measuring 6" by 12" by 6¼" high. It is equipped with on-off switch, pilot light indicator and variable volume control. The units are connected to the master station by four wires furnished with the Booster. Literature is available on request.

Booklet Available

A valuable booklet, "Highways of the Air," has been published for those interested in airports. It will be sent without charge or obligation by Radio Receptor Company, Inc., Dept. SF, 251 West 19th Street, New York 11, N. Y.

WANTED

Progressive Texas town of over 5,000 people in rich territory desires connection with airport service operator interested in basing on excellent war-built airport. Military now operates field but city and county interested in planning for postwar. State qualifications in first letter.

Write: Modern Airports,
SOUTHERN FLIGHT
Box 750, Dallas, Texas

THOS. D. BROAD
ARCHITECT
For Dallas Air Terminal
Love Field
Burt Bldg. DALLAS R-4768

How "sky garages" can increase profits through accessory sales

ACCESSORY SALES can be a profitable department if care and thought is given to the project. Here are a few suggestions:

First, a reasonably complete stock of instruments, motor and plane parts and cock-pit "extras" should be purchased. Arranged in bins and indexed to a master catalog, any part can be quickly located. Provide a catalog (manufacturer's releases) for your customers so they can make selections at leisure. Display profitable items on counters and offer descriptive literature free (furnished by manufacturers). Aside from stock purchases, a counter and a few bins or shelves need be your only expense.

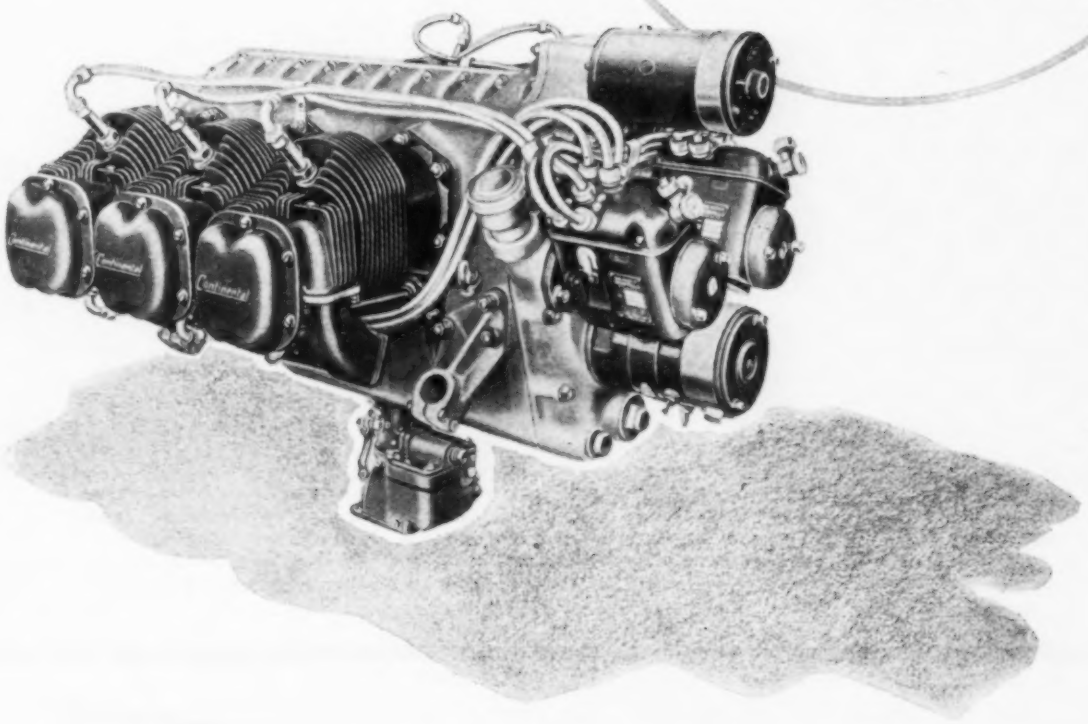
The Air-Safe Instrument Company is anxious to co-operate to make your parts business a success. You will find Air-Safe Instruments are both money-makers and good-will builders, for they are quality instruments sold with a guarantee. May we suggest you write for our catalog and price structure for post-war dealers? We think you will find it interesting.

AIR SAFE

AIRSAFE INSTRUMENT COMPANY
DIVISION JARVIS MANUFACTURING COMPANY
924 Thompson Avenue, Glendale 1, California

Scintilla "sparks" the finest

- FRANKLIN AIRCOOLED
- KINNER
- CONTINENTAL
- JACOBS
- LAWRANCE
- LYCOMING
- PRATT & WHITNEY
- RANGER
- PACKARD
- WARNER
- WRIGHT



Continental Red Seal Aircraft Engine... ultra-reliable performance for training planes. For the *ultra-reliability* required in the engines which power America's training planes, Continental Red Seal Engines are widely used... their fine performance sparked by Bendix-Scintilla Aircraft Ignition equipment.

SCINTILLA MAGNETO

BENDIX-SCINTILLA AND SCINTILLA ARE TRADE-MARKS OF BENDIX AVIATION CORPORATION

ARMY E NAVY

DIVISION OF Bendix AVIATION CORPORATION SIDNEY, N. Y.

THE SKY'S THE LIMIT

(Continued from page 20)

occurred to airline operators and as a result, they have been unwilling to put their faith in a single receiver or transmitter and have, in fact, installed duplicate equipment in all of their transport ships. In some cases, they even have a third receiver installed.

This leads us to wonder whether blind landing equipment for privately owned aircraft will ever be entirely trustworthy or dependable. With limited cruising range and gasoline capacity, it would not be safe to start out in bad weather to make instrument landings at a distant point with no ceilings. If the radio equipment failed, there would undoubtedly be a crack-up.

Some people will argue that you only have one engine anyway and it may fail too. All of which is exactly right. We don't believe single engine aircraft have much place for blind flying and blind landing.

The best answer to this kind of flying for private fliers is to let somebody else do it and stay on the ground those days when the weather is below the minimums for contact flight. After all, we have managed to enjoy most of the evenings we have had to spend some place waiting for weather and we are still here, which is more than some people who didn't wait for the weather can say.

Hidden Taxes Threaten Development

The whole matter of subsidies, municipal airports, government control over private aviation, etc. should be strongly considered from the tax angle. We cannot go on forever taxing ourselves more and more. Taxes on certain small businesses are now 80 per cent for the government and 6 per cent or more for the state. These percentages are further increased by many taxes hidden in what you do with your net profits after the government finishes trimming them down, and there are many little things the Treasury Department can make you do to cut into those profits even before you get them. Thus, many small companies are presently making no more than 3 per cent of their gross profit before taxes and many of them make less than 1 per cent on their gross volume. The taxes are ruinous and although we realize they are supposedly for the war emergency only, we nevertheless note the trend and we see what people are saying about the postwar requirements, and we wonder whether they are going to be reduced any sizeable amount. There is, of course, an ever-present alternative which the politicians seem to shy around and not want to use—taxes could be more universally applied reducing the percentage collected off of certain persons who are in the minority and applying a much lower percentage over a much wider base. This is very bad political medicine, which is the reason it has not been done. When we have politicians who are patriotic and far-seeing enough to realize that it would actually benefit many people to have their taxes increased over a wide base, then we may have this done without confiscatory taxes on anyone.

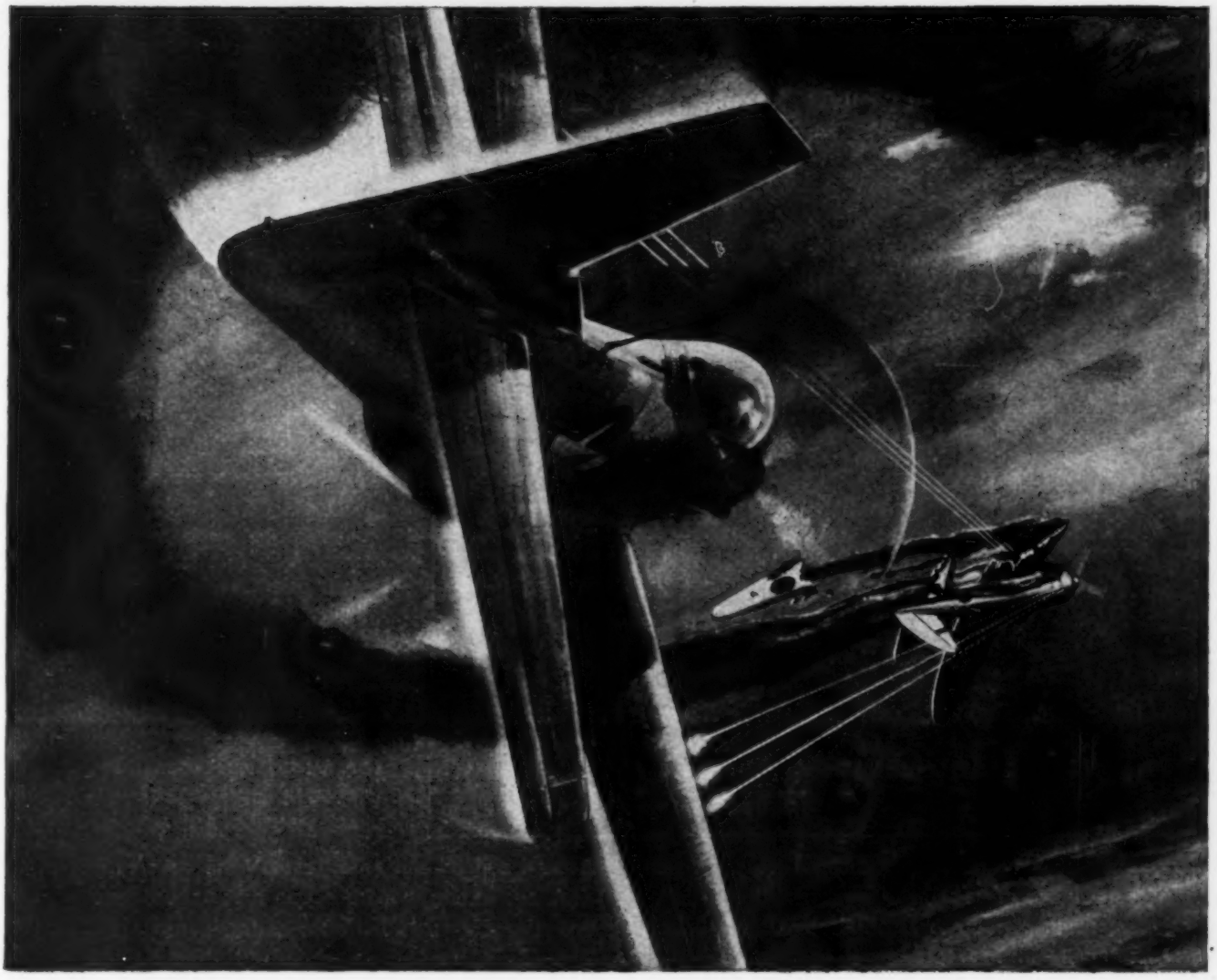
If any person residing in these United States who ever has occasion to purchase anything, whether it be a nickel pencil, a pair of shoes, a house, furniture, or whatever, should think he does not pay any considerable taxes simply because his income tax last year was $40.50, then that man is certainly a dope. As a matter of fact, statistics will bear out the hidden taxes in a pencil, or a pair of shoes, or a house, or a suit of clothes represent a very high percentage, about 60 per cent, on the average.

If any corporation or any individual business man pays high taxes, those taxes are certainly and inevitably passed on to the purchaser of his services or products. In many cases, the fact that the ultimate consumer purchases an item and pays indirect taxes by such purchase, causes him to pay more indirect taxes than had he simply paid direct taxes.

Here is a fairly shocking example: If one starts a building to house his business, he finds the architect charges him from 5 to 10 per cent of the cost. If we assume a given building cost $20,000, which is not unusual, and bears a 20 per cent load in the worm of hidden taxes, which is not unusual either, then the hidden taxes amount to $4,000.00. Assuming the architect gets 10 per cent of the total cost of the building, then the architect gets 10 per cent added on to the hidden taxes you have already had to pay, thus getting $400 simply because you had to pay $4,000 taxes. If that sounds like a screwy deal to you, maybe you should investigate a few other cases which are even more outstanding. At any rate, you can see if you paid your $4,000 of taxes in the first place, you certainly would not have to pay the architect his $400 and would save 10 per cent.

Anyway, this tax problem bears heavily upon all individuals and we must be careful to hold these things in check just as much as we possibly can. After all, a man or a company only makes so much money, and we have to choose the manner in which we spend it pretty carefully or there will not be enough for necessary matters. While we are talking about taxes, it is pertinent to note that a privately owned airport will contribute tax money to a community whereas a municipally owned airport, whether it operates at a loss or just breaks even, will contribute nothing and may actually cost the community.

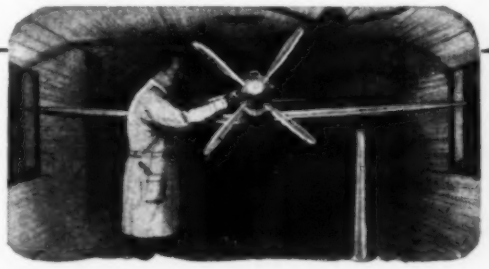
★ ★ ★



Finishing Touch

An American Mustang pilot has latched himself onto the tail of a new Nip Navy plane—the Tojo. The frantic Jap has pulled every trick in the book. Finally, in desperation he racks his Tojo into a back-breaking 180 degree vertical turn. The Mustang pilot refusing to give up his advantage, follows. Halfway around the Mustang has outturned the Tojo. At the three-quarter mark the Jap has turned into the gun sights of the Mustang. The American pilot applies the "finishing touch."

BONDS bought these planes ★ WASTE FATS helped arm them ★ WASTE PAPER helped ship them ★ GASOLNE flies them ★ WLL YOU help deliver the next squadron?



⬅ "Hurricane Hall," famed wind tunnel at North American Aviation where engineers create man-made hurricanes to develop and test the stability and flight characteristics of the P-51 Mustang.

North American Aviation *Sets the Pace*

PLANES THAT MAKE HEADLINES... *the P-51 Mustang fighter (A-36 fighter-bomber), B-25 and PBJ Mitchell bomber, AT-6 and SNJ Texan combat trainer. North American Aviation, Inc. Member, Aircraft War Production Council, Inc.*

Recommended Changes in Civil Air Regulations

THE final draft of revisions to Civil Air Regulations Parts 20, 43 and 60 were delivered to the Civil Aeronautics Board late last month by the CAB Safety Bureau with recommendations for adoption. Culminating more than a year of intensive work on simplification of regulations affecting non-scheduled airmen, the proposals include only those rules considered essential to general safety and eliminate many present rules that restrict airmen in an attempt to regulate the few airmen who disregard individual safety. In addition, the new regulations are written in plain, simple language and so organized that the pilot can find all the rules without searching through several parts of the CAR.

In the covering letter of transmittal, the CAB Safety Bureau pointed out that "undoubtedly some points of conflict will develop which will require further changes after the new rules are put into practice." The letter also recommended that a statement be prepared for public release at the time the regulations are promulgated which would say in effect that "here are the revised regulations which you have been clamoring for and which incorporate many relaxations over those under which you have operated in the past. However, it should be borne in mind that with each newly granted privilege goes a newly assumed responsibility. We hope that the immediate future will prove that you can shoulder that responsibility and thus take advantage of the flexibility in regulation that this permits. However, if the immediate future proves that our trust is not well-founded, don't be surprised or complain of a reversion back to more restrictive regulations."

Specifically, the final proposed revisions differ from present regulations in the following important respects:

After months of preparation, final revision proposals for streamlining the Civil Air Regulations have been formally submitted for CAB action.

PART 20

(1) Reduction of age requirement for private pilot from eighteen to sixteen years.

(2) Expiring a student pilot certificate twenty-four months after issuance instead of twelve months.

(3) Requiring a student pilot to pass a written examination on contact flight rules, aircraft and pilot rules, and safety practices and procedures prior to making his first cross-country solo flight. A pamphlet covering these subjects will be issued by the Administrator.

(4) Elimination of any further written examination for qualification as a private pilot.

(5) Reduction in the required amount of solo time for qualification as a private pilot from the present thirty-five hours and twenty-five hours for conventional and non-spinnable airplanes, respectively, to thirty hours and twenty hours.

(6) Elimination of spins for private pilot flight test and the addition of a test for maneuvers at slow speeds.

(7) Extending the period of physical re-examination for student and private pilots from twelve to twenty-four months.

(8) Issuance of pilot certificates with private and commercial ratings. Thus, a pilot may be rated to fly one type of aircraft commercially and another type privately.

(9) Elimination of horsepower ratings on the pilot rating record. Part 43 will require that a pilot must have recent flight experience in an aircraft of the same type and class and horsepower range prior to piloting such an aircraft carrying passengers.

(10) Increasing the experience requirements for an instrument rating from twenty hours to forty hours of which 50 per cent may be accomplished in an approved mechanical trainer.

(11) Appropriate credit for glider pilot time is provided to applicants for private or commercial powered aircraft pilot ratings.

PART 43

(1) The rules governing aircraft certificates, equipment, and operational rules which formerly were scattered through Parts 01, 04, 20, and 60 are included in this Part.

(2) Aircraft not operated commercially are required to have only an annual airworthiness inspection by an approved repair station or a person designated by the Administrator.

(3) Aircraft operated commercially are required to have a 100-hour periodic inspection by an appropriately rated mechanic in addition to the annual inspection. The annual inspection will be accepted as one of the required periodic inspections.

(4) The logging of flight time is required only to substantiate experience necessary to qualify for pilot certificates and ratings or recent experience.

(5) Approved mechanical devices may be used to record aircraft time. A record of each flight will not be required.

(6) Aircraft may be flown aerobatically for hire if all occupants other than the pilot are equipped with approved parachutes.

(7) A student pilot may be certified for first solo flight whenever he is found competent by a rated flight instructor instead of only after the previously required minimum of eight hours dual instruction. However, he must have logged ten hours of dual instruction prior to qualifying as a private pilot.

(8) Objects may be dropped from an aircraft in flight provided no hazard to persons or property is created.

PART 60

(1) Two classes of flight rules are provided — Contact Flight Rules (CFR) and Instrument Flight Rules (IFR). There are eleven contact flight rules instead of the many rules formerly relating to contact, general, and miscellaneous flight in the present Part 60.

(2) Minimum altitudes are specified for flight over congested areas and over other areas where flight at low altitudes might create a hazard to persons or property.

(3) The present contact flight rules provide that aircraft shall be flown at least 500 feet above the ground and 500 feet vertically—2,000 feet hori-

Finish the Fight – with War Bonds

Wing strength for a Superfortress

That gleaming mass of metal, rugged and thick as a railroad rail, is a lower rear spar chord, one of the vital structural members of a Boeing Superfortress wing. When the photograph was taken it was being shaped on a huge milling machine in Boeing's Wichita plant. Today it's flying over Tokyo.

The design and construction of the wing—utilizing the Boeing "117" airfoil—is one of the factors that make B-29 performance possible. Without it, long-range missions, at fighter-plane speed, with immense bomb-loads, would still be in the realm of wishful thinking.

Engineers of the Boeing Aerodynamics Unit developed the wing and proved the remarkable qualities of its airfoil in wind tunnel tests. Building the necessary tremendous strength into the wing structure was the next step, and heavy chords were designed for the main spars. Weighing 255 pounds when machined, this chord of aluminum alloy, pictured above, is the largest extruded part ever used in a production airplane.

In the systematic bombing of Japan, the B-29's superior aerodynamic design and sturdy construction have helped the stout-hearted men of the 20th Air Force to bring many a crippled Superfortress back to base, even though severely damaged over the target by flak or fighter opposition.

To the task of building warplanes worthy of the skill and high courage of American airmen, all Boeing's abilities are dedicated today.

In a future time of peace, Boeing products will continue to be soundly and honestly designed, engineered and manufactured. Tomorrow, as today, you can know of any airplane . . . if it's "Built by Boeing" it's built to lead.

DESIGNERS OF THE B-29 SUPERFORTRESS • THE FLYING FORTRESS • THE NEW STRATOCRUISER
THE KAYDET TRAINER • THE STRATOLINER • PAN AMERICAN CLIPPERS

BOEING

zontally from a cloud formation. Such conditions ground an aircraft when the ceiling is less than 1,000 feet. The draft circulated to the industry specified *clear of clouds* when 800 feet or less above the surface and also specified a 1,000-foot minimum altitude for instrument flight. However, as a result of conferences with the staff of the Administrator, the CAB Safety Bureau changed these rules so that aircraft flown under contact flight rules are required only to keep *clear of clouds* when at or below 1,000 feet outside of airport traffic zones and approach zones where instrument landings are made. Also instrument flights would be required to be at or above 1,500 feet over the surface, except when taking off and landing. The Safety Bureau believes these changes provide far more liberal rules for aircraft flown under contact flight rules and do not appear to unduly restrict aircraft flown under the instrument flight rules.

(4) A quadrantal system of altitude separation is established for off-airway instrument flight. This is a step in the direction of the helical separation system which has been discussed for several years and which at present appears to be the logical solution of a problem which will grow more acute as air traffic increases.

(5) War emergency rules are not included. Such rules as the military authorities consider necessary for reasons of security will be added prior to the time the Part becomes effective.

(6) The rules governing the transportation of explosives and other dangerous articles have been transferred to a proposed new Part 49. Since private and commercial pilots are interested mainly in the right to carry small arms ammunition, a section covering this point is included in Part 43 with a reference to Part 49. ★ ★ ★

Republic's Amphibian, "Seabee"

Alfred Marchev

PRODUCTION ENGINEERING

(Continued from page 35)

fected and is using a unique method of building "Thunderbolts" without blueprints. Known as LOFTEC system (trade name for lofting technique) the operation eliminates blueprints and costly lofting by transferring the drawing directly on the part to be fabricated. But that's another story to be covered in a later issue.

It's a cinch that Fred Marchev means business when he talks postwar. He hasn't spent the past twenty years of his life in manufacturing and engineering just for his health. Educated in aeronautical and mechanical engineering in his native Switzerland, he was flying gliders in 1908. He journeyed to the United States in 1919 to complete his education and decided to become a citizen. Working for a time with the old Thomas Morse Aviation Corporation in Ithaca, New York, he subsequently held down important development engineering posts with the Ithaca Gun Works and Western Electric. He went to Chicago in 1926 and organized the Temple Radio Corporation, serving as its president for five years. Before joining Republic shortly after Pearl Harbor he was works manager and chief engineer of Ditto, Inc., and works manager and director of Signode Steel Strapping Company.

Fred Marchev is also a very good salesman. Many of the old veterans, who voiced their skepticism at St. Louis on the matter of Republic's postwar price estimates have been signed up as distributors. And for proof as to what side of the fence they're sitting on, the best testimony is found in their 2,500 firm orders with deposits for postwar "Seabee" amphibians! ★ ★ ★

AIRCRAFT RADIO

(Continued from page 32)

Radio Service Facilities At Airports

It should be standard practice for modern airports located near cities to provide a qualified radio serviceman who will be able to repair or adjust aircraft radio equipment with a minimum of delay. Such a man should be the holder of at least a commercial radiotelephone, second class, license in order that he may make any changes in the equipment and properly test it. If it is impossible to secure a full-time servicemen or even a part-time man, the telephone number of a reliable radio repair shop should always be available at the airport.

Frequency Modulation

It is expected that frequency modulation (FM) radio equipment for aircraft will be on the market within a year after the war and will become standard after several years. FM equipment will be generally more desirable since it is static-free and almost noise-free. Also it creates less interference than amplitude modulated (AM) radio. While ignition noise has a greater effect on the higher frequencies at which FM operates, this problem will be worked out by engineers. Fewer parts are required for FM and antennas can be much shorter. FM provides a good signal-to-noise ratio transmission for comparatively short distances but is not capable of long distance transmission. However, it is reliable for use between cities twenty-five to thirty miles apart. FM radio for aircraft is expected to be allocated a band of frequencies above 108 megacycles. This would require an antenna of only about two to three feet. The most suitable antenna for these frequencies appears to be the whip type vertical antenna and a suitable standard antenna is being developed for FM aircraft radio.

The Future

Radar installations will quite probably be standard equipment on all planes for cross country flying ten years hence, but until the end of the war, little can be said about it. With radar, the safety factor will be greatly increased and there will be less likelihood of a collision with other planes or objects. Blind flying aids should be available within the reach of the average plane owner's pocketbook and facsimile radio will undoubtedly play a part in furnishing reliable weather information to planes.

It seems likely that the CAA or Bureau of Standards will set forth standards on aircraft radio equipment for postwar planes. Such standards may include the size, weight and coverage requirements for different classes of aircraft and give a table for the correct antenna length of various frequencies. ★ ★ ★

Performance!

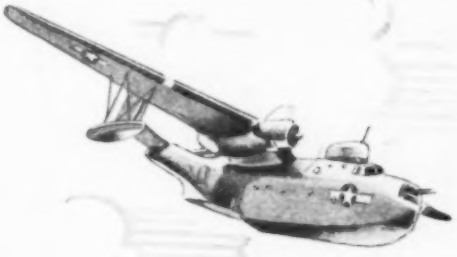
Dependability!

Maintenance!

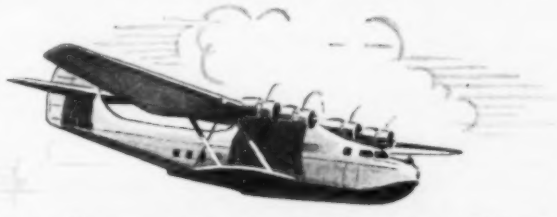
MARTIN Aircraft Excel in All 3!

TAKE the Martin B-26 Marauder, for example. Speed of over 300 m.p.h., the firepower of eleven .50 calibre guns, heavy bombload, plus a record for exceptional accuracy in bombing . . . all these establish her outstanding performance. In dependability, there's her rugged strength, structural soundness, one-engine performance. Combat losses have been only four-tenths of one percent, while in training in the U. S. in 1943 she had the best safety record of any bomber. Maintenance? She requires less than any other bomber. Result: amazing availability which enables her to be in the air well over 80% of the time.

THESE same features are stressed in the Martin Mars. For performance, there's her record of 4,227 miles, non-stop; on another flight she carried 23,846 lbs. of mail. The Mars is the world's most economical airplane. Under optimum conditions, she can operate at less than 6 cents per ton-mile for a 1000 mile trip, which is the lowest direct flying cost for any transport today. Dependability is shown in her ability to make regular trips between Alameda and Honolulu every 2 or 3 days. This same quick turn-around demonstrates the Mars' ease of maintenance, especially since a good part of this time is spent loading and unloading. She's the world's largest flying boat, can climb on two engines and withstood, in test dives, a half-million pound pressure on her wings.



EQUALLY outstanding is the Martin PBM Mariner. Long range, heavy bombload and firepower, a remarkable record both as patrol bomber and transport . . . these are proof of high performance. Dependability is emphasized by rugged construction, ability to take off and land in high seas and capacity to take heavy over-loading in emergencies. Indeed, the PBM's dependability has been demonstrated by several successful landings on dry land with only minor damage to the planes involved. Ease of maintenance has been proven by the Mariner's pioneering of Pacific NATS routes when maintenance facilities at advanced bases were rudimentary.



Martin
AIRCRAFT
Builders of Dependable Aircraft Since 1909

FIRST plane to fly any ocean on a regular commercial schedule, Pan American's Martin-built China Clipper served across both oceans for more than ten years before meeting an untimely end when she struck a darkened boat in a blacked-out harbor. During her decade of service, the China Clipper flew the trans-Pacific route for 9 years, then shifted to the trans-Atlantic run. Her long years of service are added proof of the performance, ease of maintenance and absolute dependability of Martin aircraft. The Glenn L. Martin Company, Baltimore 3, Maryland.

AIR POWER
In Action

By TOM ASHLEY

WITH organized German resistance terminated, the full force of Allied air assault will be directed against Japan on a parallel, to a large extent, with the pattern followed against Germany. But the assault will go much farther in its destructiveness and thus will be a faster campaign, capable of a speedier conclusion.

American air power has for its goal the destruction of Japan's (a) air strength, (b) industrial resources and supply and (c) ground forces. But significant departures from the European pattern will develop in the manner in which air power carries out its mission. Some of these changes have already occurred. Many more are in the making. The air war against Japan is actually months ahead of general awareness and understanding. For example, almost as many Japanese planes have been destroyed in the last fifteen months as were lost by Germany—at one-eighth the cost.

One departure from the European pattern has involved the Navy. Japan has received very serious blows from carrier aviation. Looked upon before the war as an extension of the Navy's big rifles, to be used chiefly against the enemy's fleet, carrier aviation has spearheaded decisive island campaigns, effectively supported ground forces, and has actually struck strategic air blows against Japan's home air resources. These were more than mere "raids"—1,000-plane carrier offensives have not only been numerous but were sustained for days at a time.

The B-29 has been a major departure from the AAF's European pattern, although it may appear on the surface to be no more than a long-range B-17. Three hundred B-29's from the Marianas have struck Tokyo with more devastation than 1,000 B-17's from England could inflict on Berlin. Soon they will operate from closer bases, and the same 300 will then outweigh 1,500 British-based B-17's over Berlin, and their number is growing daily. Moreover, larger bombers than the B-29 are on the way—B-35's, B-36's and B-42's.

Incendiaries Becoming Primary Weapon

It is truly a king-size air war that is shaping up against Nippon. But there is more to it than mere tonnage. Characteristics of both the missiles and the targets are important. For example, new M-69 incendiary bombs, developed especially for Japan, have caused damage never attainable in Germany. In one operation alone incendiaries burned out an area of seventeen square miles. That was during the experimental stage. Whole cities can be saturated now that the test has proved effective. The determining factor won't be any "secret weapon" or mysterious device. It will be the freedom and ability to destroy everything Japanese. Whereas the air war against Germany was complicated by strict orders to avoid damaging certain civilian areas, churches, schools, etc., few Japanese targets are thus sheltered.

Another factor is found in the comparison of Japanese air equipment with America's. Nipponese fighters and interceptors are not to be brushed aside lightly, it is true. But the record of eight Jap planes destroyed in 1944-45 for every Allied loss speaks for itself. This compares with the German record of holding their 1944-45 losses to less than two for each Allied plane destroyed. Germany's ingenious jet and rocket fighters are without a match in Japan as of April 1. But almost incredible strides are being made in U. S. jet developments—especially for Japan's destruction, with the Navy expected to use the reaction-propelled craft soon. Until now U. S. fighters have been on the weighty side, for toughness and firepower. Jets and turbines will bring lightweight advantages while retaining the stamina characteristic of U. S. aircraft construction. Also readied for Japan are the new American directed-missiles, of which the copy of Germany's buzz bomb is a publishable example. Where Allied fighters and strafers pocked German installations with .50-cal. machine gun slugs, newer planes will blanket Japanese personnel and materiel with large calibre rockets (5-in. and larger), giving each plane the firepower equivalent of a cruiser's broadside. New developments in radar will add greatly to the destruction aimed at Japan.

Attrition Weakening Japanese Air Strength

Another great difference is found in the Japanese themselves. They aren't as smart in the air as the Germans. When the air war crippled Germany's aircraft production, emphasis was shifted from bombers to fighters in preparation for the inevitable invasion, and the Luftwaffe unhesitatingly went on the defensive. To hold down attrition, German fighters withdrew to the interior, allowing Allied bombers freedom to bomb outlying targets but concentrating to defend Germany's home industries, over which Allied bombers were made to pay heavily. It proved futile in the long run, but it husbanded Luftwaffe strength for the final attacks before capitulation. On the other

LOSSES IN THE AIR WAR
February 26-March 25
(Does Not Include Probables or Damaged Totals)

	Europe		Italy		Southwest Pacific		Russia*
	Enemy	Allied	Enemy	Allied	Enemy	Allied	Enemy
Feb. 26	2	24	....	6	....	1	6
Feb. 27	83	17	....	24	1	....	6
Feb. 28	16	27	1	13	6	3	28
Mar. 1	32	34	6	7	5	....	39
Mar. 2	109	28	4	13	1	2	....
Mar. 3	32	34	2	10	....	....	49
Mar. 4	....	12	....	13	22	....	15
Mar. 5	1	26	....	8	....	5	57
Mar. 6	....	5	....	11	3	....	29
Mar. 7	18	44	....	8	1	....	39
Mar. 8	....	5	....	17	2	1	61
Mar. 9	15	29	2	14	6	3	83
Mar. 10	2	17	....	10	....	....	....
Mar. 11	....	7	....	6	....	1	2
Mar. 12	5	13	3	9	1	1	9
Mar. 13	24	18	....	6	2	....	37
Mar. 14	85	29	21	20	1	....	18
Mar. 15	112	32	3	8	4	....	33
Mar. 16	31	41	8	13	8	1	65
Mar. 17	....	13	....	1	....	1	26
Mar. 18	13	43	2	12	1	....	117
Mar. 19	67	32	4	12	6	3	116
Mar. 20	61	27	6	18	11	....	69
Mar. 21	62	38	13	8	3	....	61
Mar. 22	82	17	17	27	....	2	149
Mar. 23	36	4	4	20	2	....	107
Mar. 24	54	41	16	20	5	1	63
Mar. 25	33	47	26	7	1	....	37
TOTALS	975	704	138	341	92	25	1321
Total since Jan. 1	2028	1869	195	820	1170	68	3329

*RUSSIA: Does not reveal own losses.
CHINA: Forty enemy planes destroyed at loss of thirty-three. Totals since January 1, 491 enemy, 89 Allied.
PACIFIC: Eight hundred and seven enemy planes destroyed at loss of thirty-four. Totals since January 1, 2,007 enemy, 176 Allied.
SOUTHEAST ASIA: Twenty-seven enemy planes destroyed at loss of twenty-one. Totals since January 1, 108 enemy, 88 Allied.

(NOTE: These figures are compiled by SOUTHERN FLIGHT from daily headquarters communiques issued by the respective commands. They are, therefore, subject to periodic adjustment. Dates for Southwest Pacific are those on which figures are released; others when action occurred.)

LOSSES IN THE AIR WAR FOR 1944 — EUROPE: 9,907 enemy, 8,467 Allied; ITALY: 4,048 enemy, 3,631 Allied; SOUTHWEST PACIFIC: 3,612 enemy, 420 Allied; CHINA: 1,037 enemy, 262 Allied; SOUTHEAST ASIA: 406 enemy, 253 Allied; PACIFIC: 5,279 enemy, 445 Allied; RUSSIA: 13,989 enemy.

In the field of **JET PROPULSION** **SOLAR** *applies time-tested skills*

SOLAR is linked with the destiny of jet propelled aircraft. Major jet propulsion engine parts are now being produced in Solar plants under contracts with General Motors Corp. and the General Electric Co.

One of the principal reasons why Solar has been selected to manufacture these particular jet engine parts is because they are made of stainless steel—a metal so difficult to fabricate that it requires exceptional engineering and manufacturing skills.

Solar has acquired these skills during the past fifteen years as the leading manufacturer of stainless steel aircraft exhaust systems . . . has become a recognized authority on design and fabrication of stainless steel parts and structures to resist heat, corrosion and vibration . . . is expert at forming heat resistant metals into intricate shapes and to close tolerances.

Solar's superb stainless steel engineering is being put to good use in the important new field of jet propulsion. It is also available to companies in the aircraft industry.

ARMY ★★ E ★★ NAVY ARMY E NAVY

SOLAR

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SOLAR AIRCRAFT COMPANY SAN DIEGO 12, CALIF. DES MOINES 5, IA.

The WORLD'S WINGS

By LUCIEN ZACHAROFF

Sweden's 60-hp. Sportplane

ABOUT a year ago this department commented on Sweden's aeronautical alertness, both in aircraft manufacturing and airline operation. A new Swedish bomber was described to substantiate that assertion. Since then, taking advantage of her neutrality—which at times has been quite benevolent to the Third Reich—Sweden has continued to consolidate her position in the air world.

Only recently Swedish newspapers have published pictures of a new fighter aircraft. It is called the J-22. Mass-produced, designed in Sweden and made of Swedish materials, the J-22 is well liked by its pilots.

The private flier is not forgotten by Swedish designers. For him they have developed a new single-seater of wooden construction. Its span is 22.4 ft. and streamlined fuselage 19 ft. long. With a 60-hp. engine, it cruises at 125 mph. The ceiling of the new personal plane is 24,600 ft. A 1,060-mile range is claimed for it; this is probably greater than the range of any other type in its class.

Among other extraordinary qualities of this plane is its reported diving speed of 370 mph. If this performance report is true, the plane may well become an advanced trainer of fighter pilots. It has won the approval of Swedish authorities.

Sweden is also taking action in the realm of operations. Following last December's Swedish-American agreement concluded in Washington, it has just been additionally agreed to inaugurate a courier air service between the two nations, pending the opening of regular air services.

★ ★ ★

France Restoring Air Activities

France is taking a number of significant steps to resume her high status in aircraft production and airline operation. A National Aviation Congress was to be sponsored by the Air Ministry from April 3 to 8. In the several meetings, some of them secret, under the Congress auspices a foundation was to be laid for the future. One problem certain to be tackled concerns new aircraft types, for during the occupation French plants worked only on German designs.

While the Provisional Government's energetic Air Minister Charles Tillon is thus keeping busy France's scientists, industrialists, pilots and other specialists called to the Congress, already some 400 factories are at work, with at least 23,000 machine tools humming. But materials and skilled labor are still scarce.

The French Government will control an air transportation company replacing Air-France whose collaboration with the Nazis has rendered it utterly useless to the liberated country. Rushed to completion are eighteen principal airdromes, with another fifty secondary fields to be developed later.

★ ★ ★

Modern Bases for S. Africa

Making its bid for a place in the postwar aviation sun is the Union of South Africa. South African Airways resumed operation—on a curtailed scale, because of equipment paucity. At this time the services are between Johannesburg and Cape Town, also between Johannesburg and Durban, and Salisbury, Southern Rhodesia.

Some ten Lockheed Lodestars were overhauled in preparation for these operations. More modern transport types are to be acquired as soon as manufacturers can supply them.

The government is building a great airport at Johannesburg, at an approximate cost of $20,000,000. Two smaller ones are coming up at Durban and Cape Town. The runways and servicing facilities of these fields are expected to accommodate 150-ton aircraft.

Speaking of Africa, in the Egyptian Chamber of Deputies the Prime Minister was asked about the alleged U. S. intention to retain the currently used 'dromes for postwar commercial and world police purposes. His reply was that Egypt's policy after the war will not tolerate foreign ownership of airports, though foreign governments and firms may use them.

hand Japan has thrown everything handy at American air offensives, regardless of the odds or value of the targets and in complete disregard of the coming showdown at home. In far-off Rabaul, for example, the Japs sent wave after wave of replacements only to lose them—even as the war moved west and north to bypass that distant outpost. In the Philippines the same was repeated, but on a larger scale. While the Germans managed to hold down their air losses before the homeland was invaded, the Japs have been committing aerial hari kari, notwithstanding the war was still being fought hundreds of miles from Honshu and Manchuria, where the ultimate decisions will be made.

Jap and German Losses Compared

The Japanese are running out of airplanes at an alarming rate. Figures from official Allied communiques, as compiled in these columns every month, show the Japanese lost 14,110 airplanes destroyed in combat as against only 1,801 Allied planes destroyed during the fifteen-month period ended March 25, 1945. That is not only a loss ratio of 7.9 to 1 in our favor, but is only 2,068 airplanes less than were lost in combat by the Germans during the same period, and the Germans have been attacked by a much larger concentration of Allied air power. European operations (including Italy) during the fifteen-month period ended March 25, 1945, resulted in 16,178 German planes being destroyed as compared with 14,787 Allied planes destroyed in combat. That is a loss ratio of only 1.08 to 1. In other words, the Japs have been losing airplanes seven times as fast as Germany, but have destroyed only one-eighth as many Allied planes.

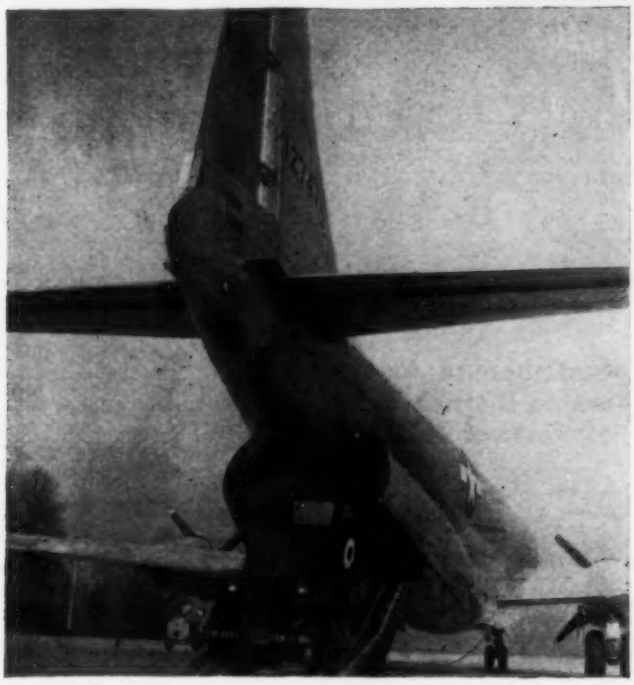
This is not to say the air war against Japan will be easy or consummated of a Sunday. There are great problems to be met, and on the ground the main Japanese armies have yet to be engaged by our ground forces. But undeniable indications point to a fuller, more decisive air war in the Orient than was waged in Europe—a campaign with the bars down and no inhibitions to hobble a vast array of new, highly-specialized air weapons and tactics just now reaching perfection.

We have gone a long way in advancing the war against Japan. But General H. H. Arnold only last month pointed out that our air offensive is still only in its early phases. The problem of destroying Japan's industrial power is not a simple one, he emphasized. In the last two years the Japs have seized a tremendous supply of resources and have had time to build up reserves. Her inner empire—the islands plus Korea and Manchuria—covers more than 730,000 square miles and constitutes a highly developed, almost self-sufficient industrial and agricultural unit three times the size of Germany. ★ ★ ★

Acme Newspictures, Inc.

Nose close-up clearly shows the double-fuselage construction of the record-breaking C-97. With a length of 110 ft. 4 in. and a wingspread of over 141 ft., the ship exceeds all existing Army Air Force transports in range, payload, and size.

Press Association, Inc.



"Bite size" for the big plane is this 1½-ton truck, shown ascending the special ramp in the tail. Identical with the B-29 except for its huge double-decked fuselage, the C-97 can carry big trucks, light tanks, or 100 troops 2000 miles non-stop in less than 10 hours.

Press Association, Inc.

Big Brother

Cargo counterpart of the famed B-29 is the tremendous new Boeing C-97, unveiled in a burst of glory when it recently made a record-shattering flight from Seattle to Washington, D. C., averaging 383 miles an hour. Whether carrying a full load in its 10,000 feet of cargo space or 100 fully-equipped troops, one thing is certain — the C-97 is in a class by itself when it comes to helping our Army "git thar fustest with the mostest."

The responsibility for powering this mammoth ship lies in four Wright 2200-h.p. engines, and playing an important part in their steady, dependable performance are CECO carburetors. Of a highly specialized design, these carburetors are built to operate at pressures ranging from sea level to 40,000 feet altitudes . . . under external temperatures running from 60° below zero to 150° above.

Every man and woman at Chandler-Evans is proud that the precision and quality of the carburetors they make is such that they have been selected as integral parts of the power plants on this superb new plane.

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CHANDLER-EVANS CORPORATION SOUTH MERIDEN, CONNECTICUT, U. S. A.

Westinghouse Aircraft Turbine Division Bids For Postwar Market

Westinghouse Electric and Manufacturing Co., which developed the first wholly American design of jet engine for aircraft by utilizing its steam turbine experiences, has established an "aviation gas turbine division" for quantity production of military and, later, commercial gas turbine aircraft engines based on its jet engine developed for the Navy.

Located in South Philadelphia, Pa., the new challenger for aircraft engine business after the war will be headed by George H. Woodard. W. F. Boyle is sales manager; Reinout P. Kroon, engineering manager, and Samuel S. Stine, manufacturing manager. All are Westinghouse staff men.

Navy Boosts Ryan Fighter Order to $103,000,000 Mark

An increase of $45,000,000 in contracts, calling for hundreds of additional Ryan fighting planes of a secret type and almost doubling the number previously on order, has been placed with the Ryan Aeronautical Company by the U. S. Navy, according to T. Claude Ryan, president. The total order for Ryan's new Navy fighting plane exceeds $103,000,000, requiring an accelerated production rate at least until mid-summer 1946.

In anticipation of the greater production schedules for the Ryan plane, last year the Navy authorized the construction of new manufacturing buildings and installation of more production facilities at the Ryan plant. Ryan's production of wings, tail sections and engine assemblies have been subcontracted to three Los Angeles aircraft parts manufacturers, which will be asked to double the number of assemblies to be built for the Ryan fighting plane.

United Aircraft Reveals Jet Engines, Gas Turbines, 3,000-hp. Wasp Major, New Fighter for Navy

Progress on new projects including gas turbine and jet propulsion engines, a new Navy fighter, new propeller designs for gas turbine engines, a new 3,000-hp. radial reciprocating engine and helicopter development has been revealed by United Aircraft Corp.

Details were lacking, but in addition to Pratt & Whitney's Navy contracts for "certain new developments in the gas turbine and jet propulsion fields," the firm is tooling up for quantity output of Westinghouse jet engines. The 3,000-hp. reciprocating engine is called the "Wasp Major" and has the largest cubic displacement of any aircraft engine. It probably is of four-row design. The newest Hamilton Standard propeller is a "Super Hydromatic," called more suitable for gas turbine engines than any other type.

Chance Vought's newest Navy fighter was not described, but will be equipped with one of the new type power plants. Sikorsky helicopter developments have emphasized larger models, and the firm said indications point to postwar commercial possibilities for adaptations of military helicopters, although this does not presage immediate use of the 'copter as a "personal" plane.

United Aircraft sales for 1944 totaled $734,527,683, excluding its Missouri subsidiary, as compared with $733,590,668 for 1943, and net profits were 1.7 per cent.

Record Output Ordered for Jet-Propelled P-80

Orders for the P-80 jet-propelled fighter plane call for perhaps the largest production program in number of planes per month and the most rapid acceleration in output ever assigned to a single airframe manufacturer, according to Robert E. Gross, president, Lockheed Aircraft Corp. in the annual report to stockholders.

The report for the year 1944 showed that Lockheed produced 14.23 per cent more pounds of airframe than in 1943 despite a 29 per cent drop in the number of employes. During the year Lockheed delivered 84,780,386 pounds of airframe, and employment dropped to 57,972 persons. Gross pointed out that this has resulted in reduced costs through efficient utilization of manpower. Sales and other income for 1944 totaled $603,363,664 compared with $669,152,490 for 1943. Conditional contracts for commercial models, such as the Constellation and Saturn, are in excess of $150,000,000.

Tulsa Plant Slows Down for Subcontractors

The Tulsa plant, Douglas Aircraft Corporation, has returned to a six-day week to allow the flow of sub-assemblies from outside sources other than the plant to catch up with the assembly line. The plant had been working on Sundays as well as week days on the A-26.

Jet and Turbine Research Included in Packard's AAF Project

The Packard Motor Car Company is preparing to include research in gas turbines and jet propulsion engines in its advanced aircraft engine developmental program undertaken at the request of the AAF Air Technical Service Command.

"We expect to do everything possible to keep ahead of the field in development of aircraft power plants," Arthur Nutt, director of aircraft engineering for Packard, said. "In this connection we are combing the market for men to work on gas turbines and jet propulsion engines. We cannot elaborate further on this subject because of military restrictions, but we do have permission to advertise for men for that type of work," Nutt stated.

Pyroxlin Lacquer Adds Speed to Jet-propelled P-80

Du Pont air-foil pyroxlin lacquer is used on the newly announced jet fighter plane, the Lockheed P-80. This is said to form such a surface as to help make the jet plane perhaps the fastest fighter in the world. In addition to the smoothness of the light gray topcoat, exposure tests indicate it is one of the most durable for this purpose ever developed. Further to reduce air resistance, all external rivets are countersunk and machined, and aircraft type putty is used to fill all dents and cracks. A coat of surfacer is applied, and finally the air-foil lacquer topcoat is sprayed, buffed and polished.

Allison Expanding Jet Aircraft Engine Output

Important new personnel assignments last month marked additional steps taken by the Allison division of General Motors for expanded production of jet aircraft engines and continued heavy output of reciprocating engines. The new appointments were: H. Ward Groom, assistant chief inspector; Carl V. Garrett, superintendent of receiving inspection; Raymond A. Wise, superintendent of jet engine inspection; and W. G. Shepherd, superintendent of inspection on reciprocating engine parts.

Another Billion-Dollar Year Swells Douglas Record; Stockholders Warned of Complexities in Reconversion

The Douglas Aircraft company last year built 180,000,000 pounds of airplanes and parts at a saving of 43 per cent in manpower and 33 per cent in costs to the government over 1943. Sales were over a billion dollars, and Douglas delivered to the government and its allies approximately one-sixth of all aircraft built in the United States.

According to the annual report of the company, the backlog on March 16, 1945, was approximately $2,000,000,000. Of this amount $129,000,000 is in commercial orders for postwar airplanes to be built as soon as military restrictions permit. The report stated that the sales total of $1,061,407,485 in 1944 established a new world record, and in pounds of airframes and parts manufactured, Douglas exceeded the 1943 figure by 60 per cent, which was thirty-eight times the 1939 volume. Average employment in 1944 was 130,000.

Since 1939 Douglas has built nearly 25,000 airplanes, most of which were heavy, medium and dive bombers, and four- and two-engine military transports.

Donald W. Douglas, president, warned the stockholders that some government bureaus or agencies may be unable or unwilling to give necessary co-operation to speed reconversion to peacetime production. Management alone cannot guarantee or control investments and jobs in the critical years of readjustment and reconversion after a global conflict of such tragic proportions, Douglas stated.

Curtiss Record

Curtiss-Wright Corporation has delivered airframe, engine or propeller for more than 100,000 aircraft for World War II, and has built its 25,000th airplane since January 1, 1938. During the same period, the corporation's other two manufacturing divisions, Curtiss-Wright Propeller Division and Wright Aeronautical Corporation have provided propulsion for more than 75,000 aircraft. More than 90 per cent of these were combat or transport planes.

Aviation Corp. Deliveries Totalled $1,233,000,000 in 1944, Up 14 Per Cent

In an annual report to stockholders, The Aviation Corporation announced that 1944 showed a 14 per cent increase in deliveries over 1943, with sales totalling $1,233,000,000. The company manufactured four-engined bombers, numerous other airplane models, cruisers, aircraft carriers, aircraft engines, propeller blades, jeep and truck bodies, airplane wing sections, aircraft sections for other manufacturers, precision and other specialized materials. The corporation's manufacturing units include the Lycoming, Republic Aircraft Products, Northern Aircraft Products and Spencer Heating divisions, and its wholly-owned subsidiary, American Propeller Corporation.

3,000 Corsairs Delivered by Goodyear in 1944

Reporting the year 1944 to be the greatest production year in its history, the Goodyear Tire and Rubber Company announced that its new aircraft manufacturing plant had turned out 3,000 Corsair planes and that substantial parts of a number of other Army and Navy planes are being produced in quantity, and there are enough placed orders to keep these plants in full operation throughout 1945. The statement also noted that Goodyear's research department was progressing in the fields of synthetic rubbers, synthetic fibers and plastics on new products for postwar manufacture.

Globe Aircraft Given C-82 Parts Contract

Globe Aircraft Corporation has tooled its facilities to produce fourteen parts for the C-82 Fairchild Packet airplane. The Globe staff assigned to direct the manufacture of the C-82 are Roy Browning, project manager; O. G. Murray, assistant project manager; and Doyle Murray, Globe's liaison representative at Hagerstown. Some of the parts which Globe will produce are wing tip assemblies, stabilizer tips, stabilizer, inboard and outboard flaps, inboard and outboard ailerons and the nose cap.

Renton B-29 Expansion Completed by Boeing

A fourth production line for the Boeing B-29 Superfortresses has been placed in operation at the Renton, Wash., plant of the Boeing Aircraft Company, marking the completion of expansion of the plant's final assembly operation, according to C. L. Egtvedt, Boeing chairman. The Boeing plant at Wichita, Kansas, also has four production lines in operation. The Renton plant functions largely as an assembly factory, integrated with Boeing Plant 2 at Seattle. Major assemblies are built at the Seattle factory and are trucked to Renton for installation.

Northrop Gets $60,000,000 Order for More P-61's

Additional contracts amounting to nearly $65,000,000 have been awarded Northrop Aircraft, Inc., by the Army Air Forces. The new contracts, together with those now in force, will extend production to an estimated eighteen month period. Of the new contracts, $60,000,000 is apportioned to the purchase of additional P-61's, and the remainder applying to added orders for B-17 cowling.

Aircraft Industry Lowers Accident Frequency Rate

The National Safety Council reported last month that the aircraft manufacturing industry had good results in accident prevention during 1943. The average frequency rate was 9 per cent below the 1942 rate and the decrease in the severity rate was 21 per cent. The improvement in 1943 experience considerably offset the sharp increases in rates during the first year of the war. American industry as a whole had less favorable results in 1943; while frequency rates averaged 5 per cent lower than in 1942, there was an average increase of one per cent in severity rates.

Globe Declares Dividend, Adds New Officers, Directors

At the annual meeting of stockholders and directors of the Globe Aircraft Corporation at Fort Worth, four new officers and directors were elected and a 10 per cent dividend was declared. C. R. Starnes was elected vice president, Jon Knox Rhodes was named assistant vice president, W. Garrett Morris was elected secretary and Norman Nicholson and Rhodes were added to the board.

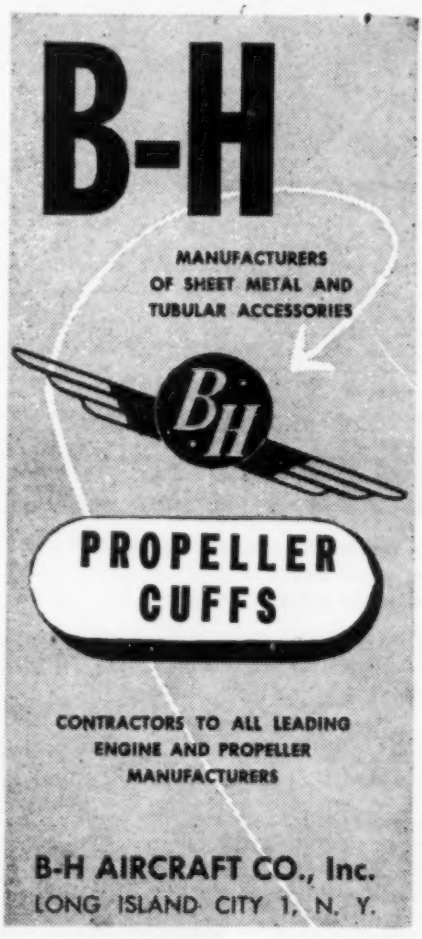
The dividend was authorized for payment on April 1. President John Kennedy's report stated that the current financial condition of the company has improved over $1,438,000 during 1944, and that resources of the corporation amount to $3,162,885. He also reported the corporation is not indebted to any commercial bank and the company earned $1.36½ per share of outstanding stock as of December 31, 1944. The company previously paid a 10 per cent dividend on September 1, 1944.

Kellett Expanding Parts and Helicopter Facilities

Kellett Aircraft Corporation, manufacturer of aircraft parts and helicopter developments at five plants in Philadelphia and Upper Darby, Pa., has leased the plant of the Pennsylvania Lawn Mower Works at Primos, Pa., to permit expansion and consolidation of its operations. The new plant will house production shops for manufacturing parts for aircraft projects. The Kellett experimental department will be transferred from the Upper Darby plant to the new one at Primos. In a second expansion move, the Kellett engineering department is to be transferred to new quarters in Springfield, Pa., placing the Kellett helicopter engineering and design operations near the helicopter manufacturing unit at Primos.

Menasco's 75,000th Landing Gear Delivered

Menasco Manufacturing Company has completed and delivered the 75,000th hydraulic landing gear for airplanes, according to John C. Lee, president of the company. Converted in 1940 from the manufacture of light aircraft engines to the manufacture of shock absorbing landing gear, the company installed new machines and tool equipment. Principal purchasers of Menasco products are Republic Aviation, North American Aviation and Lockheed.



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Kansas City, Kansas

Helicopter Power Study On SAE Project Calendar

The Society of Automotive Engineers, Aeronautic Division, has organized a special aircraft projects subdivision to co-ordinate research and development in fundamental aeronautical engineering fields, according to Arthur Nutt, division chairman. The subdivision has initiated four projects: development of a standard aeronautical drafting room practice manual; test procedures and design requirements for helicopter powerplants, transmissions and drive mechanisms; standardization of inspection stamps and symbols used in the aircraft manufacturing industry; and aircraft engine cold starting requirements.

The committee on helicopters is composed of: R. W. Prewitt, Kellett Aircraft Corp., Upper Darby, Pa., chairman; Commander R. E. Doll, Navy Dept., Bureau of Aeronautics, Washington, D. C.; Michael E. Gluhareff, Sikorsky Aircraft Div., United Aircraft Corp., Bridgeport, Conn.; Laurence LePage, Platt-LePage Aircraft Co., Eddystone, Pa.; J. P. Perry, G & A Aircraft, Inc., Willow Grove, Pa.; Frank Piasacki, P-V Engineering Forum, Philadelphia, Pa.; Stephen H. Rolle, Civil Aeronautics Administration, Washington; Major K. S. Wilson, AAF Air Technical Service Command, Dayton, Ohio; and R. A. Wolf, Bell Aircraft Co., Buffalo, N. Y.

New Aeroprop

Aeroproducts Division, General Motors Corp., Dayton, Ohio, has produced a twelve-foot, seven-inch Aeroprop for Pratt and Whitney R-2800-C engines so the paddle blades are used on regular production models of Aeroprops. Due to the basic possibilities of the hollow, ribbed-steel blade, Aeroproducts has been able to increase the activity factor of the blade 40 per cent while increasing the weight only about 15 per cent.

Curtiss Adds B-17 Work at Louisville

The Curtiss-Wright plant at Louisville is modifying an undisclosed number of B-17 Boeing Fortresses for the Army Air Forces. The Curtiss plant has been engaged in assemblying Curtiss Commando transport planes, and was recently ordered to ready the installation for modification of B-29. The plant is making the necessary changes for modification, and at the same time is continuing peak producton of Commandos.

ATSC Hiring Discharged Veterans of Air Forces

The Air Technical Service Command has started a program to place every interested discharged veteran of the Army Air Forces in a job with the ATSC. The Command has more than 6,000 types of jobs in 137 installations throughout the nation, and effort will be made to employ discharged veterans as long as vacancies exist and in capacities which will use their skills and experience in a manner that will be beneficial to the war effort.

Northrop Innovations Effect Big Saving

Employe ideas have produced a specific saving of $1,021,322, as well as man-hours and material, in building the P-61 Black Widow night fighter, according to Northrop Aircraft, Inc. Of the suggestions submitted by the employes, 18.1 per cent have been adopted by Northrop.

Link Honored

Edwin A. Link, inventor of the Link trainer, will be awarded the Potts gold medal by Charles S. Redding, president of the Franklin Institute, at annual ceremonies in Philadelphia on April 18. The award is for Link's "valuable contributions in the field of training devices for aviators."

Link's first trainer was completed in 1928. But it was not until 1934 that the device became popular when the U. S. Army, as well as various commercial aviation companies, became interested in training pilots for instrument flying. The size of his factory was soon doubled, then tripled, and in 1941 its personnel was fifty times what it had been five years earlier.

Link's latest development is a Model 45 Instrument Flying Trainer which, according to pilots, "flies more like an airplane than an airplane does." He has produced several other types of trainers for the armed services, many still on the secret list. Also he has designed an aviation-marine sextant as an aid to navigators.

ACCA Tax Group Named

Joseph F. McCarthy, United Aircraft Corp., was elected chairman of the Eastern Tax Advisory Committee of the Aeronautical Chamber of Commerce and T. R. Colborn was elected secretary at a meeting of the committee last month in New York. Additional committee members are Walter A. Mogensen, Capt. Harry L. Collins, J. C. Willson, Webb Wilson, Arthur A. Pieper, Paul A. Reck and R. E. Hoefflin.

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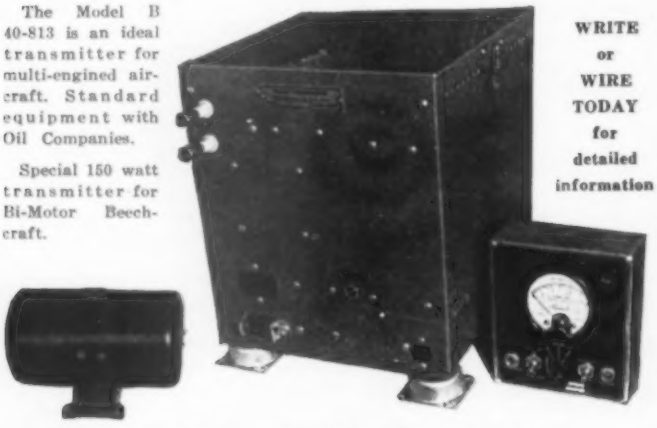

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Houston, Texas

PERSONALS

WILLIAM G. FULLER has been named assistant vice president of Globe Aircraft Corporation for administrative affairs of the company. Well known throughout the Southwest, he has been Globe's factory manager since 1942. . . . RALPH S. WHITE, former chief of the powerplant section of CAA, has been appointed manager of engineering development of Ranger Aircraft Engine Division of the Fairchild Engine and Airplane Corp. . . . GUSTAVE D. CERF has been appointed chief engineer of Edison-Splitdorf Corp., a division of Thomas A. Edison, Inc. Cerf takes the place of E. B. Nowosielski, who resigned as chief engineer. . . . H. F. TIMMINS, formerly of the engineering department of Kellogg Switchboard & Supply Company, has been named Technical Representative for the AAF. . . . ARTHUR C. OMBERG has been appointed chief research engineer of the Bendix Radio division of Bendix Aviation Corp. Omberg was formerly assistant chief of the operational research branch of the U. S. Signal Corps. . . . Also announced by Bendix Radio was appointment of DR. HAROLD GOLDBERG as research engineer.

CHARLES J. ROGGI and MARVIN J. PARKS have joined the staff of Fairchild Aircraft Division to work on the C-82 program. Roggi is to be connected with the commercial sales program, while Parks is to be the flight service engineer. Both Roggi and Parks were formerly employed by Curtiss-Wright. . . . J. FRED DUNN has been named comptroller for Ryan Aeronautical Company, succeeding James C. Noakes, who resigned. . . . also at Ryan, WILLIAM HOFFMAN has been appointed assistant to the comptroller and JOHN B. HILL has been elected secretary of the corporation.

M. G. "MICKEY" McGUIRE has been named chief test pilot at Ryan. . . . ROBERT H. KITTNER has joined The Glenn L. Martin Company as manager of its newly created Plastics and Chemicals division and CLAYTON F. RUEBENSAAL has been made technical director for the division. . . . ROGER WARD was appointed Chief of Laboratories at Martin. . . . ARTHUR A. PIEPER has been elected financial vice president of Republic Aviation Corporation. . . . RAYMOND P. LANSING has been elected a director of Bendix Aviation Corp., taking the place of G. A. Rentschler who resigned. Lansing is a vice president and group executive of the corporation. . . . BERNARD GOULD, formerly in charge of Dip Tank sales, has been appointed general sales and advertising manager of Aeroil Burner Company, Inc.

TO COMPANY PRESIDENTS:

Today—thanks largely to you and other industrial executives—22,000,000 civilian workers are speeding victory and achieving postwar security through the Payroll Savings Plan. Over 60% of the 6th War Loan subscriptions came from this source—and, between drives, this forward-looking plan has been responsible for 3 out of 4 War Bond sales!

Good as this record is, the Payroll Savings Plan can be made more effective by giving Bond buyers a definite idea of the many benefits accruing to them. To accomplish this the War Finance Division has prepared a variety of active aids—*an entertaining moving picture, an interesting booklet and a handy War Bond envelope.*

Passing this particular "ammunition" requires that you reappraise your own company's Payroll Savings Plan. Have your own War Bond Chairman contact the local War Finance Committee—today! They will welcome the chance to discuss this new program with you.

The Treasury Department acknowledges with appreciation the publication of this message by

Southern Flight

This is an official U. S. Treasury advertisement prepared under the auspices of Treasury Department and War Advertising Council

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NEW PRODUCTS

Plastic Blind Rivet

A new plastic blind rivet allowing one man operation and blind fastening has been disclosed by the Plastic Development Division of the Victory Manufacturing Company. Called Des-Rivets, the new rivets are molded as one piece consisting of a head with plug attached by a thin breakaway section and a tapered shank split to form four tapered fingers. The shank and head are hollow to the same diameter as the plug. The new rivet is applied by pressing the tapered fingers into a drilled hole. Impact from the rivet gun which may be manual or air operated, shears the plug and drives it into the plastic shank until flush with both ends of the rivet. Contour of the rivet head is maintained. The new rivets are recommended by the company for use with metal, wood and plastic components. A variety of shapes and sizes are available.

Rubber Cement Eliminates Rivets

The B. F. Goodrich Company has announced a new type rubber cement, called Plastilock 500, which is said to be non-thermoplastic, water and aromatic oil-resistant adhesive for bonding metals, wood plastics and ceramic material to themselves or to each other. The company claims the new cement provides bonding qualities in any of its applications and in some cases can be used in place of rivets or screws. Best results are said to be gained by using heat with pressure, though heat alone is said to give some adhesion. Bond strength varies with materials being adhered. The new adhesive, used for metal-to-metal bonding has shown a shear strength of 3,250 pounds per square inch, according to the company. Tension strengths of 4,000 pounds per square inch are said to have been reached.

Lubricant For Air-Driven Tools

The W. C. Walter Company, producers of Air Luboil, claim 50 per cent less maintenance and longer air-driven tool life have resulted by use of their lubricant on this type of equipment. Air Luboil is said to combine oiliness and high film strength, at all temperatures and speeds, regardless of type of air-powered equipment used. The company stated the new lubricant will provide instant lubrication of all moving parts even after long periods of idleness. Rust formation is said to be retarded by the oil, which has penetrating qualities.

New Fuel Pump by Romec

Manufactured by the Romec Pump Company is a new non-pulsating fuel transfer pump, which was developed for use in the B-29 and other heavy aircraft. The new pump has a rated capacity of 900 gallons per hour at 27.5 volts, 14-in. Hg discharge pressure, 8-in. Hg inlet suction, 14.5 amps. Max. Ports are tapped 1¼-in. N.P.T. The new transfer pump is non-corrosive throughout and is said to be unaffected by extreme temperatures. Combined with a GE motor and the Sprague radio noise filter, the pump is known as Unit RD-6100. The motor is reversible, continuous duty, shunt wound and explosion-proof type.

Handy Marker for Pipes, Rods

Rolamarker has been announced by Adolph Gottscho, Inc., for marking round tubes bars, pipes, rods and such with a repeated impression. Recommended by the manufacturer for stockroom attendants, receiving departments or distributors as means of identifying materials, the new device marks the nature of the material, hardness, alloy, diameter and the complete length of the piece. The die cylinder is preceded and followed by "V" rollers for guiding the impression to the top of the round metal piece, keeping the Rolamarker from running off the metal piece. The manufacturer features four models of Rolamarker units. Literature is available upon request.

Lightweight Rivet Gun

A new rivet gun said to be lightweight and compact has been recently announced by the Cherry Rivet Company. Designed for installing Cherry Blind rivets, in the hard-to-get-at blind spots, it is operated by one hand and installs the rivet from one side of the job, with a pulling job, thereby making the installation a one man job. Called the G-35, the new rivet gun is recommended for installing Cherry Blind rivets in sheet metal, plywood, rubber, plastics and almost any soft or brittle material. Measuring 11½ inches in length and weighing 1½ pounds, the gun is considered compact and flexible.

Ryan Tool for Dimpling

The Ryan Aeronautical Company has announced development of a method for dimpling high-strength, heat-treated aluminum alloys in all thicknesses up to and including .081-in. The new method utilizes a tool which fits the standard dimpling machine, and the procedure is easily learned. It is said to produce well-formed dimples without radial or circumferential fractures. Stressing is distributed over a wide area, eliminating stress concentrations and consequent fractures. The dimple has the same angle as the rivet head and nests around the rivet head in close contact with all its contiguous area.

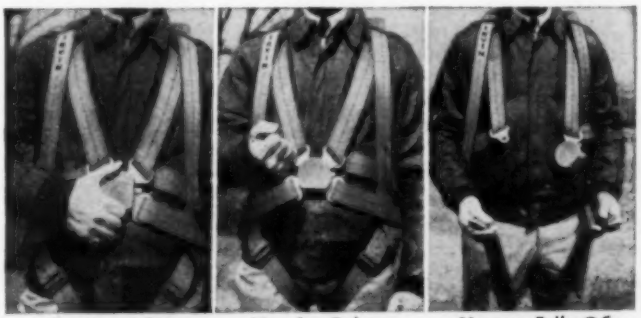
IRVIN Air Chute

"SINGLE-RELEASE" Harness

UNITED NATIONS' FLYERS
are using it for
SAFER LANDINGS

A one-hand turn and a tap on the single frontal disk instantly releases the harness . . . leaving the flyer entirely free. Accidental release is impossible before disk is "set" for action.

All United Nations' Air Forces for years have used IRVIN as standard equipment . . . and now the Irvin "Single-Release" harness is acknowledged as superior for all landings. IRVIN, as always, leads in Safety.



Twist and Set | Tap for Release | Harness Falls Off

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BUY MORE WAR BONDS

Secretary Wallace Takes Ercoupe Flight Lessons

Secretary of Commerce Henry A. Wallace is learning to fly an Ercoupe under the instruction of Paul Young, the Civil Aeronautics Administration's assistant chief of general inspection. He has expressed a keen interest in aviation, and it is believed a pilot's license for him will pave the way for wider recognition of civil aviation's possibilities and problems in government circles.

C-47 Used in Laying Phone Wire from Air

Laying telephone wire by airplane has been accomplished by the AAF Air Technical Service Command. In a recent demonstration, a C-47 was used to string sixteen miles of wire over rough terrain in six and two-thirds minutes. The cargo plane flew at low level and slow speed while multiple reels in the cabin played out the wire. A parachute and weight were used to start the operation.

Luscombe Moves Into Growing Texas Aircraft Colony With $300,000 Project on 500-acre Dallas Site

The Luscombe Airplane Corporation has acquired a 500-acre site near Dallas for development of a major aircraft manufacturing and operations center, with a $300,000 project scheduled for early construction as the first phase of the program.

A building in Dallas was acquired as temporary headquarters and parts storage, and arrangements were under way for the construction of several hangars at the site, on which a modern, all-weather airport is being developed and for which Civil Aeronautics Administration approval has already been obtained.

Leopold H. P. Klotz, president, and officials of Luscombe had considered the move to the Southwest for some time. The Dallas property will be used initially for Luscombe's war production of precision, all-metal parts and components for military aircraft. Luscombe is well along with plans for resuming quantity production of its all-metal Silvaire, one of the nation's most popular lightplanes.

Factors leading to selection of Dallas as the Luscombe site included its location in the heart of the great Southern aviation market and availability of war-trained aircraft production labor. Local aviation and business circles gave Luscombe full co-operation in its study.

In order to relieve congestion at the Trenton, New Jersey, factory, Luscombe is now constructing two hangars on their new site, one of which will house replacement parts for over 1,000 Luscombe owners. The second hangar will be used for continued development of experimental postwar models.

The Luscombe site is about seven miles north of Dallas in the Garland community, where Continental Motors Corporation and Southern Aircraft Corporation operate large aviation factories, both with well-developed but undisclosed postwar plans. Postwar lightplanes already have been announced by two manufacturers in nearby Fort Worth, Globe Aircraft Corp., having widely advertised its Swift as the first in a line of designs for the private flier, and Johnson Aircrafts, Inc., having advertised its single and two engine Rockets as high-performance contenders for the personal aircraft market. No commitments have been made regarding postwar plans for North American Aviation's huge Dallas factory and Consolidated Vultee's larger Fort Worth plant, but while NAA is not expected to operate in Dallas, Convair might utilize the Army-built and Army-owned Fort Worth facility for heavy transport construction after the war. Lockheed Aircraft Corporation operates a large modification center in Dallas, but has made no mention of postwar plans. Development of the Guiberson Diesel Engine Company's aircraft diesel is being accelerated in Dallas. Dolan Aircraft Manufacturing Company of Dallas, large-scale manufacturer of precision parts, is expected to remain an important supplier after the war.

CAA Gets Helicopter to Study Requirements, Design; Radar Experiments for Civil Flying are Invited

The Civil Aeronautics Administration has initiated important studies of helicopters and radar for civil aviation. A Sikorsky YR-4B, loaned by the Army, is being used to develop requirements for certificating helicopters and their pilots. About twenty helicopter pilot ratings have been issued to date by CAA, which is continually receiving new applications.

Using a large quantity of equipment made available by the Army and Navy, the CAA is conducting exhaustive research and experiments at Indianapolis for the perfection of radar for civil aviation use in air traffic control and weather flying. Possibilities of combining radar and instrument approach systems for blind landings also are under study. One of the chief projects involves use of a practical radar screen in an airplane to indicate the presence of other airplanes, both laterally and vertically, as an anti-collision device. Air traffic control would be directed from a control tower radar screen on which all planes within a certain radius are pictured, regardless of weather.

In addition to its study of certificating requirements for helicopters and pilots, the CAA will use the Sikorsky YR-4B to familiarize its personnel and train some of its men as rotor-wing pilots, and one of the primary research projects will involve vibration problems and blade motion studies.

FIRST FLIGHT PHOTO OF JOHNSON ROCKET, with Rich Palmer at the controls, shows speedy lines of Fort Worth-built cross-country plane for private fliers desiring high performance. Nose wheel retracts into well at rear of engine, while main wheels retract inward. Company performance figures include 185-mph. cruising speed, 950-mile range, 56-mph. landing speed.

Better Rates, Rules for Aviation Life Policies Reported by Institute

Liberalization in aviation underwriting by life insurance companies, halted at the start of the war, has now been resumed, according to a report by the Institute of Life Insurance covering thirty-six companies and quoting Holgar J. Johnson, Institute president. Since January 1, a number of the companies have adopted rates and rules more liberal than those applying in prewar 1940. The report included the following:

Owner-operators of private pleasure planes are insured by more than a third of the companies at extra premiums which are about 50 per cent under prewar 1940, and companies not insuring such fliers at all have decreased from 25 per cent in 1940 to 8 per cent. Passengers of private pleasure craft are insured by nearly one-third of the companies at standard rates if such flights are not excessive of normal (ranging up to 100 hours annually; in 1940 the amount of flying recognized as normal or standard was less than half that amount).

Civilian pilots of private company planes are insured by about the same number of companies as in 1940, but the extra premium, depending on pilot's training, type of flying and quality of plane, now ranges from 50 to 80 per cent lower than in 1940. About the same number of companies as in 1940 (more than half of them) insure passengers of private company planes at standard rates where flying is not excessive (up to 100 hours annually), while in a few cases there is no limit on the amount of flying.

Airline pilots and crew members are covered by only half the companies at extra premiums ranging from 50 to 80 per cent lower than in 1940, and policies range up to $25,000 at the extra rate as compared with a limit of $5,000 in 1940. Airline passengers are covered at standard rates by more than two-thirds of the companies, regardless of the amount of flying. In 1940, slightly more than one third of the companies accepted such passengers at standard rates regardless of the amount of flying.

An aviation committee set up by the Actuarial Society of America began studying the relationship of life insurance and aviation in 1929, and its studies have now been expanded, with an eye to postwar flying expansion, through activities of the American Life Convention and the Life Insurance Association of America, which represent most of the country's life companies.

Closer Ties Between Distributors and Dealers Urged by ADMA Group

Dealer training programs, model plane-building promotion and the holding of meets to further cultivate interest in aviation were some of the topics discussed at the meeting of the Merchandising Committee of Aviation Distributors and Manufacturers Association last month in Cleveland. Thomas G. Tynan stressed the importance of closer relations between distributors and dealers, and the use of slide films and motion pictures in dealer training. Other members of the committee present were C. L. Corwin and Ray Snyder.

Airbank of America to Finance Aircraft

A new aircraft finance company has been formed under the name of Airbank of America, it was recently disclosed. Lazare Baker of St. Louis is president of the new firm and Tom Collins is vice president and secretary. Airbank of America has offices in St. Louis, Dallas and Los Angeles and will operate on a national scale handling aircraft notes, Collins stated.

Flight Contractors Expanding for Postwar

Some of the nation's major air service operators, having completed AAF war pilot training assignments, are expanding their commercial facilities in anticipation of postwar development in civil flying, according to the Aeronautical Training Society.

Anderson Air Activities, Milwaukee, Wisc., has opened sales and service bases at Fond du Lac and Lake Lawn, Wisc. The Lake Lawn operation is a seadrome. The bases teach flight training, including Link instruction.

Akron Airways, Inc., is expanding flight training, maintenance and overhaul facilities.

Embry-Riddle Company is continuing flight training for American and British cadets at Arcadia and Clewiston, Fla., and is redoing its facilities for overhaul of engines, airplanes and instruments in anticipation of civilian business. Flight instruction and technical training for civilians figure heavily in postwar plans.

Graham Aviation is spreading service bases in Pennsylvania, with operations at Pittsburgh County Airport where it is constructing private flying installations costing $100,000. An air college is to be constructed at Pittsburgh in conjunction with A. G. Becker, president of Pittsburgh Institute of Aeronautics.

Hawthorne Flying Service, Inc., is spreading bases in the Carolinas. There are now operations at Columbia and Orangeburg, S. C., and Rocky Mount, Greensboro-High Point and Fayetteville, N. C. Hawthorne Airways is an applicant for mail pickup routes in Virginia and the Carolinas. At present at the Orangeburg base, the organization gives primary instruction to French aviation students.

Hylan Flying Service, Inc., is developing a private fliers' airpark at the field at Rochester, N. Y. A feeder line operation in New York and other Eastern States is proposed.

Page Airways, Inc., is a service and civilian flight school at Rochester, New York.

Parks Air College operates five primary training bases for the AAF, and has enlarged the college for more technical students. At Alabama Institute of Aeronautics private and commercial flight courses for women are offered.

Southeastern Air Service, Inc., has its principal bases located in Georgia, and operates a flight school in conjunction with the University of Georgia at Athens. A number of associate bases are being opened by Southeastern in the Carolinas and Georgia, and will be individual ownerships with sales, service and maintenance co-ordinated with Southeastern.

Southern Air Services is arranging for a chain of bases in a 250-mile radius of Memphis. Southair, Inc., is a feeder line applicant.

Southern Airways, Inc., has commercial bases in Alabama, Georgia and the Carolinas. Southern Airways has an application for a feeder airline netting the Southeastern states.

Southeastern Air Express, Inc., is a feeder airline applicant for the Southeastern states. Affiliated in the company are Southeastern Air Service, Inc., and Columbus Airways, Inc., of Columbus, Georgia.

Alaska Air Bibliography

The Library of Congress, Division of Aeronautics, has published a bibliography of aviation in Alaska. The work has been compiled by Arthur G. Renstrom under the title *Aeronautics in Alaska: A List of References.* There are 469 separate references listed, divided into categories, and, in most cases, each part is chronologically arranged.

In the forward to the bibliography, A. F. Zahm, chief of the aeronautics division of the Congressional Library, states in part: "The increasing importance of Alaska, strategically and commercially, and its expected pivotal position in postwar aviation, appears to make a wider distribution of this bibliography desirable. An attempt has been made to cover the entire literature on flying in Alaska, from 1913 to date."

FOR "OVER WATER" OPERATIONS
FLARE PISTOL AND FLARE EQUIPMENT BEING STORED ABOARD EMERGENCY LIFE RAFT*
*Photo courtesy Pan American Airways System
FLARES ARE A NECESSARY PART OF SAFETY EQUIPMENT
Stowed as emergency equipment in a rubber life raft, these "International" Flare-Signals may be the deciding factor between rescue or death for the occupants should a forced landing at sea be necessary.
"International" Flare-Signals and Pistol are approved by the CAA. Illustrated above is the parachute type, which has great range of effective visibility, and is also approved by Merchant Marine Inspection of the U. S. Coast Guard to meet their mandatory requirements on emergency equipment for life boats and life rafts.
Flares and Signals by "International" are favorably known in aviation and marine operations for maximum efficiency and dependability.
INTERNATIONAL
FLARE-SIGNAL DIV.
of THE KILGORE MFG. CO. Tipp City, Ohio

NEW PLANES MAY GO TO AIRLINES BEFORE END OF YEAR

By E. H. PICKERING

Steps have been taken by the War Production Board indicating possibility of deliveries of production-line aircraft to the airlines beginning with the last quarter of 1945, and for the abandonment of reconversion of war surplus transports released by the Army.

A requirements program for new aircraft deliveries to the operators is being drafted by the WPB's Aircraft Division and special committee of Jack Frye, president of TWA; Franklin Gledhill, PAA vice president; Ralph Damon, AA vice president, and C. Bedell Monro, PCA president. All airlines were asked by WPB to submit detailed estimates of aircraft needs, based on the WPB assumption that new aircraft will become available in 1945 but that models now in production will be the only ones available. Four-engine types are included.

Reconversion of surplus war transports has been criticized by Henry Nelson, director of WPB's Aircraft Division, as costing practically as much as a new plane. Operators have pointed out that conversion takes more skilled mechanics and about as many dollars as the manufacture of new ones, while the production of new planes has a smaller impact on manpower than reconversion of surplus military models.

Airline requirements are being presented by an airlines industry advisory committee appointed by WPB. Its members are top executives of twenty airlines.

Pan-American Bids for Eight Domestic Routes

Back in the days when Postmaster General Brown was in the saddle on the job of apportioning air routes and air mail contracts, an informal arrangement was made among Post Office Department, domestic airlines, and Pan American Airways in which Pan American agreed not to participate in domestic business, and the domestic lines were not to seek international routes. This informal understanding has continued until recently when practically all of the domestic lines became ambitious to operate throughout the world. Pan American, of course, has been fighting them on this ambition, but not until March of this year did they retaliate by seeking routes between points within the United States.

Requests for eight routes were filed on March 19 for services between New York and the terminals New Orleans, Miami, Los Angeles, San Francisco, and Seattle; between Chicago and the terminals Miami, New Orleans, Los Angeles, and Seattle. Authority was not requested to operate to any intermediate points, and it is assumed that services between these terminals would be by aircraft continuing to foreign destinations. Stipulated in the applications was the condition that such services should be granted only if the domestic airlines are extended into foreign fields.

Fare Reductions Delayed

Plans of many of the domestic airlines for varying reductions in passenger fares, (some direct reduction, others through reinstatement of the Air Travel Plan and discounts on government transportation) were cut short in March by a CAB order directing hearings and investigations on the subject within sixty days. CAB may be holding the reductions in abeyance until decisions are rendered on the recent "show cause" orders that plan a substantial reduction in mail pay to the "big 4" airlines. This would give the airlines an opportunity to check the potential revenue in view of such reductions, if effected, before making reductions in passenger fares.

Great Circle Mileages

The Coast & Geodetic Survey of the Department of Commerce is now computing great circle distances in statute miles between all airline points certificated by the CAB. This mileage will then be the basis for air express and air cargo rates forming a more equitable basis for division of revenue between connecting carriers. The mileage will be based on central points within each city and will not vary with changes in airports or new patterns of air routes. It is expected that airport operators engaged in charter operations will also find use for it in establishing their charges.

Profits Reported

American Airlines in its report on 1944 operations showed a record net profit of $4,396,163 after a provision of $4,000,000 for Federal Income Taxes and a million-dollar reserve for transition to peacetime operations. Operating revenues for the year increased almost 25 per cent to nearly $40,000,000. . . . United Airlines in their annual report for 1944 showed a net income of $6,114,991 after nearly $5,000,000 provision for taxes, and a half-million provision for postwar readjustments. Gross revenues were nearly $36,000,000.

Gorrell's Last Speech

On March 1, Colonel Edgar S. Gorrell, president of the Air Transport Association, was scheduled for a talk before the Aviation Writers Association. He was taken to the hospital, however, and died four days later from a heart ailment. His final speech as read to the writers summarized the problems facing the airlines today, and in doing so, summarized Gorrell's work during his years as president of the association. Colonel Gorrell said that the airlines must get their costs down, improve the reliability of their service, and work harder than ever to sell passenger and cargo service. If these are accomplished, the prospects of the industry will be bright, if outside influences, such as state barriers and discriminatory and burdensome taxation, are not permitted to restrict the industry. Further, there must be no destructive competition within the industry's own ranks and there must be a complete independence from surface carrier control.

Jack Knight Passes

On a snowy night in 1921, the fate of air mail and air transportation rested entirely upon the shoulders of one small individual. The war had been over but three years, and in a few days leadership of the country would change from a Democratic to a Republican administration whose keynote was to be economy. The air mail had not been a success. It saved only a day over train time coast-to-coast. The air mail service planned a spectacular day and night through-trip with which it hoped to prove the potential of air transportation. But the weather killed one pilot and grounded two others of the four that started. It fell on the shoulders of Jack Knight to fly not only his stretch from North Platte to Omaha, but also to go on into Chicago. All that night, partly over a route he had never flown, without radio and without beacons, Knight flew through fog and snow. The mail got through, and President Harding and the new Congress voted additional appropriations to continue the air mail service. Jack Knight went on to roll up the amazing total of 18,000 flight hours with United Air Lines, and during the war, headed a mission to South America for Defense Supply Corp. On February 24, twenty-four years and a day after his first famous flight, Jack Knight died in a hospital at Niles, Michigan.

Les Arnold Back

Col. Arnold

Colonel Leslie P. Arnold has returned to his position as assistant to the president of Eastern Air Lines and subsequently has been elected a vice president of the company, after serving as commanding officer of the 39th Air Freight Wing in this country, and after receiving the Legion of Merit from General Eisenhower for his work as commanding officer of the 302nd Air Transport Wing in Europe. He was one of the Army fliers who flew around the world in 1924.

More Profitable Stratoliners

TWA's five original Stratoliners, returned by the Army several months ago, have been renovated by Boeing with features such as B-17 wings, engines, and landing gear added. TWA now is finishing the interiors preparatory to resuming transcontinental scheduled service. New wings add considerably to the otherwise uneconomical payload.

Foreign

Pan American Airways has received the first of two Constellations to be used in Miami—Africa—Orient division service for the Air Transport Command. Delivery of the first ship set a new Burbank-Miami record of eight hours and forty-three minutes for the 2,500-mile hop.

The U. S. Chamber of Commerce has recommended prompt acceptance by this country of the agreements drawn up at the International Conference in Chicago late last year. The recommendation was offered both Congressional and executive authorities considering the agreements.

French airlines expanded greatly during the occupation by the Germans, a recent OWI release states. Although the number of planes was cut to a third, route mileage increased approximately 30 per cent, miles flown increased a third, passengers carried quadrupled, and tons of freight carried nearly doubled, all in the year 1943 as compared to 1938, the last full prewar year.

Military

Early this year there were sixteen daily regular departures from California over the Pacific network of the Air Transport Command. C-54's constitute nine-tenths of the equipment used. The route to the Philippines by way of Honolulu, Johnson Island, Kwajalein and Saipan totals 7,497 miles. ATC operations over the "Hump" into China have exceeded expectations by nearly four times during the month of January. Forty-four thousand tons were flown in that month with record operations reaching a peak day of over 400 trips by 300 airplanes moving nearly 2,000 tons of supplies.

Southwest Conference Told 300 PT's Going to CAP Units Soon

A three-day Army Air Forces-Civil Air Patrol regional training conference, first of its kind ever held in the United States and expected to be followed by similar conferences in other regions, was attended in Dallas last month by more than 170 AAF and CAP officers from Texas, Oklahoma, New Mexico, Arizona, Louisiana, Arkansas and Colorado.

It was revealed that CAP units in all forty-eight states will soon embark on a three-phase revised training program for Cadets and adult members. The curriculum includes comprehensive ground-school studies and a flight proficiency program for adults.

AAF representatives told the conference that within a few weeks CAP will receive 300 Army primary trainers to use in giving so-called familiarization flights, replacing the 200 Army liaison planes now assigned to CAP. AAF officers also said some 20,000 Cadets will be selected to attend ten-day encampments at AAF bases this summer, compared with the 7,500 who went to the camps last year.

AAF specialists spoke in classroom sessions on problems of leadership, supply, command and staff duties, military academic instruction, AAF organization and duty assignment, discipline and courtesy, physical training, drill, inspection and ceremonies.

Among those addressing the conference were Col. Earle L. Johnson, national commander; Col. Harry H. Blee, national training officer, and Lt. Col. R. S. Risien, office of the assistant chief of air staff, training, Army Air Forces. The Texas Wing, commanded by Lt. Col. D. Harold Byrd, in co-operation with the Dallas AAF liaison office commanded by Lt. Col. C. F. Modglin, acted as host.

Flight Scholarships for Cadets Furnished Through New Projects

The Reading, Pa., CAP squadron has raised more than $5,000 for flight scholarships to be given the best cadets. The local commercial operator, a member of CAP, has donated one scholarship and will solo the cadets at $50 each.

Two newspapers and two department stores in Davenport, Iowa, are to finance scholarships to give solo time to the leading boy and girl cadets of the local squadron. Business men in Jacksonville, Fla., are backing a similar plan.

In the North Carolina Wing, several flying services have offered their local CAP squadrons prizes of free flight instruction up to solo for cadets who make the highest grades in their preflight courses. One operator is offering a 100-mile and a fifty-mile cross-country trip to the winning cadets.

CAP Headquarters Moved From New York to Fort Worth; Supervision Now Under AAF Training Command

Headquarters of the Civil Air Patrol were being moved early in April from New York City to Fort Worth, Texas, where the Army Air Forces Training Command assumed supervision of a responsibility for CAP headquarters. Gen. H. H. Arnold has been exercising control over CAP through the office of the Assistant Chief of Air Staff, Training, Headquarters, AAF, Washington. The new move means General Arnold will now exercise his control through the AAF Training Command. Lt. Gen. Barton K. Yount directs the Training Command.

Offices for CAP headquarters are in the Texas & Pacific building at Fort Worth, along with those of the AAF Training Command headquarters. Moving "day" was to last until about the middle of April, after which Col. Earle L. Johnson, Air Corps officer who commands CAP, and his staff will be fully in business again.

"It is very gratifying to all of us in the Civil Air Patrol to become a part of General Yount's Training Command," said Colonel Johnson. "Working with and through the nation-wide facilities of this organization will strengthen the CAP. The CAP will continue its cadet recruiting and training program until we reach our quota of 250,000 cadets between the ages of 15 and 18 who will receive preflight instruction in the many phases of aviation. The close co-operation that I know we will receive from the Training Command will enhance our educational courses for these youths. The Civil Air Patrol will greatly benefit from the tremendous experience and 'know how' acquired by the Training Command from their program that has made the AAF the world's largest and greatest air force."

The move was described by Col. Johnson as a decentralization to the field, pacing CAP wings in closer touch with the AAF Training Command. The move also places CAP headquarters in a central location, making it more accessible to units throughout the nation.

Michigan Busy With Cadets, Ice Patrol, Flight Proficiency Development

Michigan Wing, CAP, held a cadet procurement week last month, Capt. Don Davidson, wing staff, worked with the state superintendent of schools and the Detroit superintendent of schools to send squadron representatives to high schools to explain CAP training to boys and girls. Also in the Michigan Wing, Capt. William Haboush's squadron flew the annual ice patrol for the U. S. Coast Guard. The patrol located ice jams on the Detroit River. The Michigan Wing is planning its Flight Proficiency program, with prizes going to the pilots who have developed the highest proficiency.

Insignia and Uniform Changes Announced

The correct Civil Air Patrol uniform has been described in CAP Regulations 35-1 issued by National Headquarters. The one major change is that the CAP cut-out is to be worn on the left side of the shirt collar when the blouse is not worn. This replaces the Air Corps wings and propeller which had been part of the standard insignia. Another change is the removal of braid from overseas or garrison caps for both senior and cadet members of Civil Air Patrol. These changes are necessary, according to National Headquarters, to distinguish more clearly CAP members from members of the Air Corps.

New Squadron Formed At Berkeley, Calif.

A Berkeley, California, Unit of Civil Air Patrol was formed by the Oakland, Calif., Squadron at an organizational meeting last month at which fifty-three men and women signed applications for enlistment.

Classes are to start immediately on meteorology, navigation, airport protection, crash procedure, terrain familiarization, air rules and regulations and other basic training subjects required for membership in the Civil Air Patrol.

GOING! GOING!

Better Hurry . . . Now!

We still can fill orders for CAP Handbooks . . . BUT DON'T PUT IT OFF. There is a paper shortage and we can promise no more of these manuals when these are gone.

This is not a sales talk . . . just a friendly warning that squadrons needing handbooks should get their orders in NOW! Many CAP'ers have rushed orders to us air mail. Many have written that they have found the handbook invaluable to them in their work—worth many times its small cost. YOUR copy will be on its way within a day after your order is received.

Order blanks furnished on request. Or simply advise the number of copies wanted and enclose remittance to cover. Price 65c each with ten per cent discount on orders of 200 or more. Sorry . . . no C. O. D.'s, but we'll gladly ship and bill orders for ten or more.

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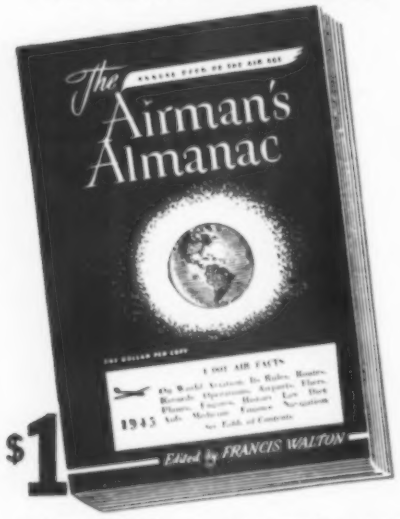

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BOOK REVIEWS

Two Hundred Thousand Flyers, *by Willard Wiener, published by The Infantry Journal, 1115 Seventeenth St., N. W., Washington 6, D. C., price* $2.75.

This dramatic recital is the first complete record of the men behind the men who fly the fighters and bombers and transports. These men were the operators of the Army's Contract Pilot Schools, the flying instructors, ground school instructors and mechanics who teamed with the Army to train raw Aviation Cadets in flying fundamenetals. It is a book from which every American will get a thrill of pride.

Ground Instructor Rating, *by Charles A. Zweng, published by Pan American Navigation Service, 12021 Ventura Blvd., N. Hollywood, Calif., price* $3.00.

This new third revised edition has been greatly improved. The chapter covering "Methods of Instruction and Classroom Work" has been enlarged. The remainder of the text covers the principal subjects on which the applicant for "Ground Instructor" is examined, i. e., Navigation, Meteorology, Aircraft and Aircraft Powerplants.

The Aeronautical Dictionary, *by Thomas A. Dickinson, published by Thomas Y. Crowell Company, 432 Fourth Ave., New York 16, N. Y., price* $3.50.

Over 6,000 terms are defined in this book with over 300 drawings and photos brought into play to impress indelibly upon the user's mind the exact meaning. If it is a specific operation that is being defined, for instance, the reader is told how it is done and why. If an instrument or a tool is being defined, where possible, the manufacturer's name is listed. The appendix contains numerous charts and tables, a bibliography, and other valuable information.

The Physics of Flight, *by Alfred Lande, published by Reinhold Publishing Corporation, 330 W. 42nd St., New York City, price* $2.50.

The information offered in this book is for all who are or expect to be engaged in operating, designing, or manufacturing aircraft. The basic principles involved in the flight of airplanes are given in condensed yet comprehensive form with the non-essentials trimmed away. The author's aim is to provide a framework which students of engineering and physics can utilize in attaining a thorough knowledge of aerodynamics.

Some consideration is given also to helicopters, autogiros and robot bombs.

Aircraft Mechanical Drawing, *by D. J. Davis and C. H. Goen, published by The McGraw-Hill Book Company, 330 West 42nd St., New York City, price* $2.50.

Intended for the student without previous training in mechanical drawing, this elementary textbook presents in a clear, simple manner the essential principles and skills required for a thorough knowledge of practical aircraft drafting. The materials used, the problems assigned, and the method of presentation conform as nearly as possible to the work encountered daily by those engaged in the preparation of productive engineering drawings. Special attention is given to the latest design practices and advanced manufacturing methods in the aircraft industry.

Production Engineering in the Aircraft Industry, *by A. B. Berghell, published by The McGraw-Hill Book Company, 330 West 42nd St., New York City, price* $3.00.

A practical text embodying principles, illustrated by specific cases, questions, and answers, for the solution of common problems encountered in the aircraft industry. The author explains the application of principles of estimating new contract costs, budgeting and scheduling direct labor hours, controlling work in process through the use of time standards work simplification, material saving, statistical and graphical reports, etc.

Lanz Aviation Dictionary in Nine Languages, *by John E. Lanz, published by P. D. and Ione Perkins South Pasadena, Calif., price* $6.50.

This new language dictionary is a complete and up-to-date collection of aviation terms and their definitions in English, with the translation of each term into Spanish, Portuguese, French, Italian, German, Russian, Chinese and Japanese.

Supplementing the dictionary section is an Appendix of valuable charts and tables. A special feature of the tables is the method of conversion from one value to another.

Aircraft Vibration and Flutter. *by C. R. Freberg and E. N. Kemler, published by John Wiley and Sons, Inc., New York City, price* $3.00.

This book explains the fundamentals and general phases of vibration and flutter affecting both stationary and rotating-wing airplane structures and their parts in non-technical language, with a minimum of mathematics.

The material used is arranged to give the most practical aid in problems of aircraft testing and analyses.

NEW LITERATURE

Lear, Inc., *Piqua, Ohio,* has published a 24-page booklet titled, "Lear Know-How", giving the story of the Lear organization and the Lear philosophy of development and production. It is printed in colors and contains numerous illustrations. Among the Lear products covered are Linear and Rotary Actuators and Power Units, Motors, Flexible Power Shafting, Automatic and Remote Controls and Aircraft Radio Equipment.

Abrams Instrument Co., *Lansing, Mich.,* has released a booklet titled "Photogrammetric Equipment", describing and illustrating the equipment and services available through it and two other Abrams companies, the Aerial Survey Corporation and the Aircraft Corporation.

Aircraft Screw Products Company, 47-23 *Thirty-fifth St., Long Island City, N. Y.,* has just published two new bulletins. Bulletin No. 240 describes "Heli-Coil" Inserts Kits for field servicing, salvaging and maintenance of stud and cap screw assemblies. Bulletin No. 260 describes two interesting maintenance and salvage operations in the shops of a prominent airline and of an engine manufacturer.

Sinclair Refining Company, 630 *Fifth Ave., New York* 20, *N. Y.,* has published a new edition of "Aircraft Engine Lubrication" adding information about aviation greases and lubrication of accessories to the complete discussion of engine lubrication in the previous edition. The new brochure is in fifty-two pages with color plates. Copies may be obtained without charge (while the edition lasts) by addressing Aviation Sales Department.

MacGregor-Goldsmith, Inc., *John and Findlay Streets, Cincinnati* 14, *Ohio,* offers a free, thirty-six-page illustrated flying manual for amateurs. This booklet gives the vital rudiments a beginner must learn in eighteen easy-to-understand lessons. Flight maneuvers are explained and other interesting flying in-

formation is included. The first edition went very quickly and a big second edition is being printed to take care of anticipated requests. Write direct to MacGregor-Goldsmith and ask for "How To Fly" by Rex Cleveland.

The Aviation Writers Association, *New York City,* has mailed approximately 3,500 copies of its semi-annual roster to aviation industry representatives, aviation associations, daily newspapers, Army and Navy public relations posts and members of Congress and of government departments.

The roster reflects the steady growth of the membership, and the expanded mailing was undertaken to acquaint more people with the nature of the association and its work.

Additional copies of the roster can be obtained by writing the executive secretary, P. O. Box 856, Grand Central Annex, New York 17, N. Y.

Government Policy Toward Commercial Aviation, *by Gilbert Goodman, published by King's Crown Press, 1145 Amsterdam Ave., New York 27, N. Y., price* $1.60.

This book presents a detailed study of government policy regarding competition and the regulation of rates. Not only the operators of commercial airlines, but also all students of political science who are interested in the processes and effects of government regulation will value the information which Dr. Goodman has assembled and the conclusions which he reaches. The book is paper covered and contains 122 pages.

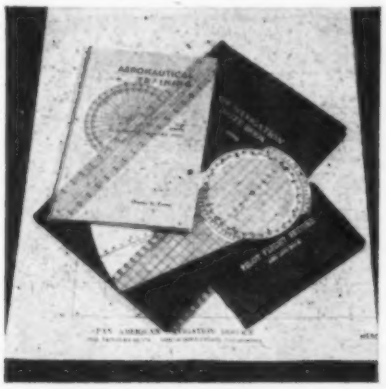
Charles Bruning Company, 4700 *Montrose Ave., Chicago* 41, *Ill.,* has released a new booklet titled "It's Positively Right in Bruning Black and White," designed to present the primary advantages of the Bruning BW Direct Printing Process.

Chicago Rivet & Machine Company, 1830 *South* 54*th Ave., Chicago, Ill.,* has just published an elaborate 16-page brochure to signal their entrance into a new field. Four models of their new line of Automatic Riveting Machines are illustrated and described.

The edition is limited, but while the supply lasts a copy will be mailed on request to interested executives of any manufacturer fabricating aircraft assemblies.

The Youngstown Miller Company, *Sandusky, Ohio,* has announced a new bulletin YM-800 which describes the operation and exclusive features of their Plastic Coaters. Twenty-two different models with a wide range of dipping compartment sizes and melting capacity are available. This literature will be sent on request.

Pan American World Airways, 135 *East* 42*nd St., New York City,* has issued an informative new booklet entitled "Let's Get Better Acquainted," and designed to promote cultural and commercial relations with Latin America. A folder entitled "Aerial Trade Arteries to Latin America" is being distributed at the same time.



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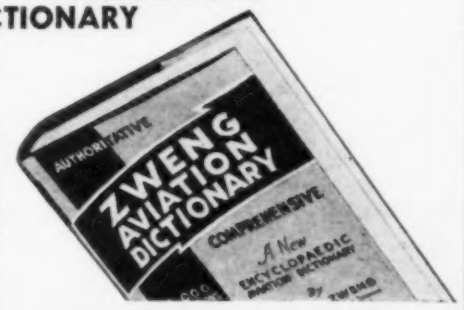

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By TONY HAGMANN

Dallas, Texas . . . The Dallas Chapter of the Texas Private Fliers Association had a meetin' (which was more like an Irish wake) and the heretofore free air of Texas was said to be going on the block to aviation legislation, at Austin. We were told to vote "Ya" to House Bill 309 in order to keep various types of snide characters from gobbling up our free air. Reminds us of the time the undertaker said: "Nobody wants to die, but if you do—use our service."

Breaking even on talking and listening were: B. J. Anthis, chapter president, who gave the nod to this one and that one; Fleming Waters, Howard Smith, E. J. Reeves, Kelly Omdalen and George R. Clay, who made Mary Royse clap hands by speaking up for air marking; Bob Kenty and George Jalonick, III.

A quick look over the room found Jean and Lou Foote, Paul A. Kennedy, E. E. Chapman, Bill Campbell, Bing Luna, C. R. Kimball, Jack Lake, H. W. Bryant, Lee Poole, W. R. Milner, Alma Daigle, Louie Love, John Surratt, Willard Walpole, Lee Davis, F. C. Pallitt, Donald McCann and Mary Davis. L. B. Haskins represented the press. Little Vida Foster took the notes . . . she's our local secretary.

About the third round we thought there would be a call for an ambulance, but everybody insisted they were just kidding. There was talk of chestnuts and fires, which we didn't savvy . . . and everybody kissed and made up. Some fun, eh, Kid?

Another meeting of larger scope was the CAP meetin' of all the head guys who had a training conference complete with speeches, lunches, dinners and high falutin' shin-digs. Okayed by the ODT for reasons we were frozen to tell, the CAP made plans for more and more CAP to be used in schools, and the Cadet program was given a double green by Washington Army and CAP men who know whereof they do a fine job. "Because we build fine Americans," Colonel Earle Johnson said, "our services will continue."

Some of the Arizona CAP'ers cut a fine row of cotton during their stay, notably Major Mike Morris and Colonel Zake Addington, USA (retired), who followed the lead set by their Wing Commander, Colonel Frank Beer. And if you looked twice, you'd have seen Henry M. Robinson from New Orleans, looking for thick coffee. Captain R. E. Box and Lt. A. N. Horseman of Corpus Christi kept smiling at everybody. There was a pair from Colorado who complimented us on our CAP Handbook . . . Lt. M. G. Bowman and Harry Clarke . . . we smirked, like a cat after eating a mouse dipped in sherry.

Groups 1, 2, 3 and 4 of the DL CAP threw a party which caught on like a grass fire with Marjory Tietsch, Rosalie Smith and Jane Barnett as hostesses . . . and Captain Mary Royse won the rumba contest, or should've. Captain Jim Camp got all stuck up with females . . . At the speakers table was Wing Commander D. H. Byrd; Col. H. Blee, USA; Col. F. Beer, wing commander, Arizona; Lt. Col. Rex P. Hayes, Arkansas wing commander; Lt. Col. Carl Modglin, AAF CTLO USA, DL . . . send self addressed postcard for explanation . . . and all the top people from "Six States and Texas" . . . who are Civil Air Patrol biggies.

Important announcement: A single man, Bob Tozer, who is one of Bendix Service Engineers, has come to Dallas to take the place of Fred Branston. Fred has gone to China to see if he can learn Chinese for Eclipse Aviation Accessories. But Fred is an ole married man and left Bob NO little black book with local numbers and this is a very sad situation. If interested send letter and picture care of Southwest Airmotive, Love Field. Better hurry.

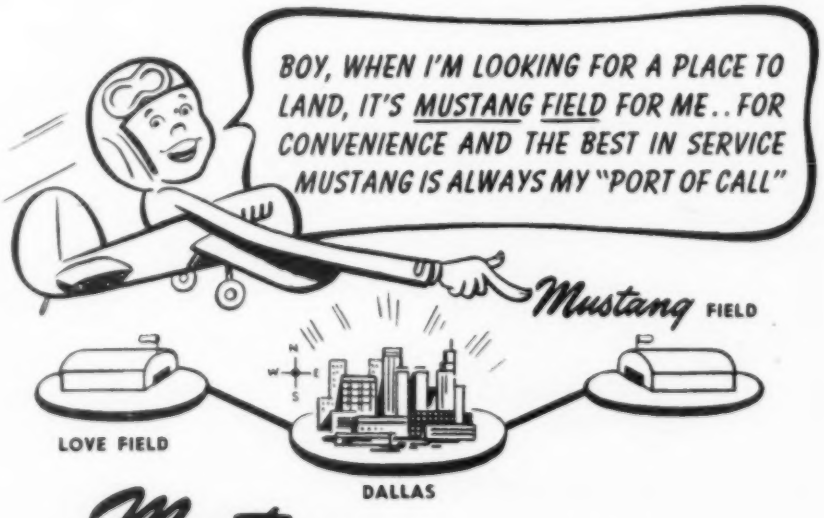
You know those Cabots who speak only to the boss? Well, it ain't necessarily so. We cornered their pilot, Henry Reynolds, who flies a Cessna between Pampa, Texas, and every place else and he said they were fine people and besides if they didn't have that carbon plant out west, our tires would be very sorry tires, because carbon makes 'em black, hard wearing and just plain good. Just can't trust rumors any more. Bye now.

On Tour With Tony . . . Wichita is browned out, which means everybody goes around on Braille after dark, something to do with saving electricity, and they also have snow. But they are building a chuck wagon full of very fine airplanes every hour on the hour. We saw pictures of a new Culver which will make all Culver fans' mouths water, and the Beech fans will cheer over their new Model 17 . . . and Cessna gave us that knowing smile, so we think Wichita has some good things cooking. Besides there are some hidden jobs being worked on in the back yards . . . and you know what that means.

Out at Beech we saw Mrs. Beech who moves mountains of work in and out of her office and we couldn't find a frown to show for it, proving certain women are good executives. Then Carl Wooten bought lunches and beat out hangar talk with Ed Nilson, Bill Beaufort and this'en. We decided aviation must be here to stay because they get so many letters asking for postwar Beech information. But for a real deal you should see the China dog on H. McDaniels' desk. Removable head, fitting on either end and we made the dog president of the CAIC* Club (*Cripes, am I confused!) Must be referring to the OPA . . .

Culver's one and only "By" Woodbury and Al Mooney were checking some pictures of their latest (to us) plane, when we booted through the snow into their office and they let us peek. Strictly a beaut. Bill Taylor bought us a coffee and Bill Sutherland showed us the new concrete runway. We met Earl Price and Howard Burnes. Very friendly and like the rest of Wichita busy as a bee during bluebonnet season.

O. A. Morard, Jr., took us to a CAP meetin' (meetin's are sure a hot item these days) and we saw the Wichita Headquarters of the Kansas Wing Service Squadron, where they grind out a neat paper each week and teach Cadets one thing and another at way over the legal limit of 25 mph. Strictly on the beaver detail were Adj. Toni Snell, W. O. Joanne Auer, W. O. Kay Conroy, W. O. Marion Larkin, Pvt. Jo Vogle, Maj. Paul Threlfall, Capt. M. Murdock, 1st Lt. Wayne C. Foster, 1st Lt. Vern Manning, 2nd Lt. Lewis Bowers (jeeps if these are spelled wrong, forgive us) and 2nd Lt. Lionel Barley. The telephone was ringing like crazy but that didn't stop Lt. Ray Fisher, Sgt. Joe Ripp, Sgt. Howard Marsh, Sgt. L. Norman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or W. O. Robt. Otey from working; or Pvt. Fay Cole, 1st Lt. Don Jarmon either. After the evening's efforts we took out for the CAP officers' club and ate ice cream sodas.

Then we rolled up to the fog-bound airport (it was during a snowstorm from Denver which really came down) and only waited an hour for the stuff to lift, thence to Tulsa. We had arrived in Wichita via O. W. Wortman's super Cadillac and left via Continental's super flying machine . . . both we heartily endorse as fine postwar places to use up bonds.

But at Tulsa, we were stuck until Jack Maddox, who flies an Aircraft Sales Co. charter job, was heading home with his passenger O. C. Whitaker. They rescued little Nell and off we went into the wide blue, headin' for the Red River . . . but fast. And in Cow-town, we wuz rescued by D. H. Byrd in the Pete Cavender flown Lockheed . . . with Colonel Earle Johnson . . . which proves traveling ain't so dad burned hard if you know everybody who's going your way too. In fact, we'll endorse knowing fine folks as being the best way in the world to eat chocolate candy, which we lurve.

Another tour.—By the time this is printed ye correspondent will be in California gathering news and views of the flying westerners, and maybe a flying movie star. Jiggs Murray, of the Houston Murrays, gave us the idea, to check up on the celluloid stars who hold their own tickets.

Birmingham, Alabama — *by Edith Wideman.* The proverbial loss has been the proverbial gain for Birmingham and Washington, respectively—Marguerite Johnston, aviation editor of the *Birmingham News*, has departed for the Capital City and is now Washington correspondent for the *News-Age Herald*. Marguerite is a brilliant writer with reportorial talents possessed by few—so it's a glorious success she'll be. We are all glad for her, but the tears flow like wine over losing her—that is, if we had any wine.

Carroll Cone was presented to Aero Club and told of Pan-American's plans as they will affect these parts. State Director of Aeronautics E. W. Stanford was noted as one of Cone's most ardent listeners. Ed Armes who has been carried on the Service List of the Aero Club for three long years is being welcomed back to the fold—in civvies too. Mrs. Sumpter Smith was made an honorary member by the board at its last meeting—in honor of Sumpt, who was one of the charter members of the club. And have you ever heard Mayor Jimmie Arrington, Col-

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lins, Mississippi, tell why a town of 1,100 population needs an airport—it's one you shouldn't miss—both convincing and clever.

The local aviation planning committee has submitted its recommendations to the City Commission . . . Among which were the recommendation for another Class 4 airport; Municipal to be turned over to private flying and fixed-base operation; building a new hangar on Municipal; widening of ramp in front of terminal building; installation of neon approach lights to the runways; and more and better exits and entrances via roads and highways to the airport. The recommendations also stressed the need for two or three airparks or small airports.

A well deserved promotion has been given Tom Eve, erstwhile general manager of Southern Airways operation at Greenville, S. C., and later of SA's operation at Charlotte, N. C. He is now vice president of Southern Airways, in charge of airplane modification. Bill Tyler has joined the forces of SA and is now working out of the Atlanta operation.

Since Ed Bishop has been made DTM for Delta we are having a hard time keeping up with him—we did catch him long enough between his roaming out and across the district for him to give us an interesting high light on two of his gals; Jacqueline Barr and Onzelle Dorroh married boys who were stationed at the same field—they married three days apart at Harding Field, but only since they came to work for Delta did the two wives realize this. Both husbands went overseas; Jacqueline's husband has just been home for rest and recuperation and is on his way back to the fighting front. Onzelle's husband was killed in action a short while back.

Ed, along with others, traipsed down to UG to present the airline industry viewpoints to the legislative committee on such and stuff. Johnnie Daniels was there from Eastern's BH field office—Vance Tomlin and Morry Knowles represented PCA—Delta's Stan Webber and Eastern's Counsel Smythe Gambrell hied in from Atlanta.

Eastern Agent Pauline Rucker has returned to the CTO after a month's study at the Agents School in NY—more work but more fun, she reports.

Aviation Committee of Jaycees have under consideration a recommendation made to them by the National JC to aid and abet local aviation. Well, stir your stumps, boys—let's go!

Kansas City, Missouri—*by Marion Melcher.* To have folks rally 'round, the Red Cross moved a small piano into the station master's office at the terminal during the War Fund campaign. Along came Jose Iturbi one evening, with a half hour to idle away between planes. He spied the piano, and the next thing the keyboard was giving out with classics mixed with Iturbi's special brand of boogie-woogie.

Among our travelers: W. E. Kline, CAA, was in the nation's capital at a regional manager's meeting; Bill Brown, commissioner of municipal airports, treked on down to Oklahoma City last month to advise on that city's new municipal air base. He was a guest of City Manager Aurand.

When L. Welch Pogue, chairman of the

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SOUTHWEST . . . SERVING AVIATION SINCE 1925 IN THE . . . SOUTHWEST

CAB, was a luncheon speaker guest in town recently, he made a tour of the new Grandview airport. The CAB official complimented our auxiliary field, which is authorized for use when the municipal air terminal is closed in.

A new sight in the city is the two-motored Grumman amphibious Coast Guard plane based at Fairfax for the next two months. Lt. W. E. Prindle and a crew of two men are patroling waterways from here to Omaha and near St. Louis during the spring flood-threat. The plane is scheduled to carry only four persons, but if necessary will be employed for emergency rescue work.

At the glider show on Fairfax field not long ago many a feminine eye was turned on the demonstration in the pickup of a glider by a tow plane. You guessed it. The tow-line was made of nylon!

Here's the new line-up for officers and board members of the Kansas City Unit of the Women's National Aeronautical Association following the annual election on March 14th:

President, Mrs. Helen Stewart; 1st vice president, Mrs. Nadine Nicholas; 2nd vice president, Miss Helen Meiners; recording secretary, Miss Jean Daily; corresponding secretary, Miss Katherine Delany; treasurer, Mrs. Bertha McCartney; three-year board members, Miss Frances Kypke and Miss Willi Williamson; two-year board member, Mrs. Marie Tracy; one-year board member, Mrs. Kenney Ellis; continuing on board are: Miss Neva Rea and Mrs. Eunice Mecaskey; ex-officio member, Marion Melcher, immediate past president.

Mrs. Stewart, the president, is the first woman meteorologist ever hired by an airline. She is employed with Transcontinental & Western Air, Inc.

Phoenix, Arizona—*by Margy Hardeman.* Howdy, you-all! The best of the West to you—and greetings to three lovely ladies recently transferred to the Sky Harbor Airways' communication station, namely, Phyllis Davies and Annette Domecus from Los Angeles and Willa Fraser from Lewistown, Montana. Good luck to Bess Bethancourt, of Southwest Airways, who went to join her husband in Washington, D. C.

Over Marsh & Franklin way Mel Hickman got his commercial and Harold Shoemaker received his private. Charlotte Foster, Charles Recker, L. R. Litchard and Mr. and Mrs. O. R. all soloed. Arizona State Teachers college is well represented by Pearl Allen, Georgia Amberson, Dorothy Larson, Marjorie Nash, Bonnie Patterson, Jean Polsor, Antoinette Rais, Elaine Rais, Dorothy Shipley, Mickey Stauffer, Bonnie Wooton, June Zuroff, Robert Morley and Charles Nichols. John Mills, Clark Bramwell and Stuart Nichol are from the Judson School for Boys.

John Caywood received his instrument rating and Phebe Williams received her private license. As soon as she got it, Phebe left us to go to the tower in San Diego. Ben J. Cahill disappeared for a few days—'twas rumored he went to Los Angeles. Colonel Wooten, sales manager of Beechcraft, was here in (of all things!) a Beech. Rose Terzian was selected by AiResearch Mfg. Co. to attend their classes on cabin pressure regulators—smart girl! Polly Georgous (or Gorgeous Polly—either way you want it!) didn't like working the "grave-yard" shift. Mustangs, Inc., have their ship, The Eightball, flitting around again. Sure do miss seeing Betty "Spare-ribs" Brokken around.

Lee McWilliams is kept rather busy these days. Personnel of the Airways communications station at Cochise who look forward to his scheduled visits there are Neil Weidner, chief operator, who is working for a private license; Harry Witter, assistant chief operator, who has a private and is now working for a commercial; and Virginia Stahler, also working for her private. Others who fly there are Harvey Gallagher, Warren Namon and E. M. Hodges. At Rodeo, N. M., J. E. Permoley, chief operator of Airways Communications there, G. H. Bradford, assistant, and Lois Stubblefield are all flying toward their private tickets. Mrs. Delia McLean and P. L. Trudeau are also students at Rodeo. In addition to the above, Lee is instructing a few right here at Sky Harbor, namely, Margaret Webb for her instructor's rating, Charles Sherrill, Martha Apperson and E. J. Rainey—all for private licenses.

Well—it looks as though it is going to rain—and *that* is news in Phoenix. Oh, yes—Ben J. said he would annihilate me if I didn't tell you all that Pork Chops got her commercial! Bye now!

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